



NYC

Hurricane Sandy After Action

**Report and Recommendations
to Mayor Michael R. Bloomberg**

May 2013

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Cover photo: DSNY truck clearing debris
Credit: Michael Anton

Foreword

On October 29, 2012 Hurricane Sandy hit New York City with a ferocity unequalled by any coastal storm in modern memory. Forty-three New Yorkers lost their lives and tens of thousands were injured, temporarily dislocated, or entirely displaced by the storm's impact.

Knowing the storm was coming, the City activated its Coastal Storm Plan and Mayor Bloomberg ordered the mandatory evacuation of low-lying coastal areas in the five boroughs. Although the storm's reach exceeded the evacuated zones, it is clear that the Coastal Storm Plan saved lives and mitigated what could have been significantly greater injuries and damage to the public.

The City's response to Hurricane Sandy began well before the storm and continues today, but we are far enough away from the immediate events of October and November 2012 to evaluate the City's performance to understand what went well and—as another hurricane season approaches—what can be improved.

On December 9, 2012 Mayor Bloomberg directed us to conduct that evaluation and report back in a short time with recommendations on how the City's response capacity and performance can be strengthened in the future. This report and the 59 recommendations in it are intended to advance the achievement of those goals.

This report is not intended to be the final word on the City's response to Hurricane Sandy, nor are the recommendations made here intended to exclude consideration of additional measures the City and other stakeholders could take to be prepared for the next emergency. But these recommendations are based on several months of intensive and comprehensive effort by City agencies, and include input from many stakeholders, including nonprofit partners, New York State agencies, and an extensive set of hearings held by the New York City Council. We hope you find this report useful, and we look forward to working within the City and with many other public and private stakeholders to implement these recommendations and any other measures that strengthen the City's ability to meet the needs of New Yorkers when the unexpected happens.

On a final note, we would like to thank the thousands of City workers and volunteers who worked tirelessly for days, weeks, and months to help New Yorkers and our City recover after the storm. Together, we will ensure that the City is even better prepared to meet New Yorkers' needs going forward.

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Table of Contents

FOREWORD	1
INTRODUCTION AND EXECUTIVE SUMMARY	4
COMMUNICATIONS	6
GENERAL AND HEALTHCARE FACILITY EVACUATIONS	8
General Evacuation	9
Healthcare Facility Evacuations	11
PUBLIC SAFETY	12
911 and Emergency Response	12
Public Safety Operations and Equipment	12
Power Outages, Generators, and Boilers	14
SHELTERING	16
Shelter Logistics and Operations	16
Special Medical Needs Shelters	17
RESPONSE AND RECOVERY LOGISTICS, UTILITIES, AND INFRASTRUCTURE	18
Residential and Commercial Building Re-occupancy and Public Infrastructure Restoration	19
Fuel and Transportation	21
Debris Removal	22
Telecommunications	24
COMMUNITY RECOVERY SERVICES	25
Food, Water, and Goods Distribution	26
Vulnerable Populations and Special Needs	27
Access to Healthcare	27
Restoration Centers	28
NYC Service Coordination of Volunteers and Donations	29
Business Recovery	30
ONGOING RECOVERY	32
Housing: Hotel Program and NYC Rapid Repairs	32
Nonprofit Recovery	32
Collaboration with Mayor's Fund to Advance New York City	33
Community Development Block Grant-Disaster Recovery Programs	34
CONCLUSION	36
APPENDICES AND RESOURCES	37
Appendix A: List of New York City agencies and acronyms	
Appendix B: Post-Sandy Survey of Zone A Residents	
Appendix C: Sample Utility Outage Report	
Appendix D: Sample Fuel Report	
Appendix E: Sample DOB Structural Assessment Report	
Appendix F: Sample Daily NYC Rapid Repairs Reports	



Photo: NYC Department of Transportation / Stephen Mallon

Introduction and Executive Summary

This after action report is a high-level summary of recommended improvements to the City's operations before, during, and immediately following Hurricane Sandy and was developed by the Mayor's Office with input from the many City agencies that responded and continue to participate in the City's recovery from the storm. This report is not an exhaustive list of all lessons learned; it includes some, but not all, of the many internal operational adjustments that City agencies will make—and in many cases have already made—to staffing, communications, and deployment of resources. Rather, it is a roadmap of the strategic steps the City will take to improve our ability to protect life and property in the face of the increasing risk of severe weather. Organized by crosscutting themes and focused on addressing the City's most immediate needs before, during, and after a severe storm, this report establishes the City's priorities for how to prepare for the next severe storm. In many cases, the recommendations in this report are applicable beyond coastal storms and will increase the City's overall preparedness to respond to catastrophic events.

The current iteration of the City's formal preparations for a coastal storm began in 2000 with the release of the Coastal Storm Plan (CSP), a collection of programs to prepare and respond to a storm, including evacuation, sheltering, and logistics planning. A coastal storm presents a known but largely unpredictable threat: known because large coastal storms form far away from the northeast coast of the United States and can be tracked for several days before they impact the New York City region. Coastal storms are unpredictable because despite knowing their general course, bearing (the direction toward which the storm is heading), and strength, storm conditions can change rapidly and dramatically right up to the time that impacts are felt (or not) in the City. The Coastal Storm Plan anticipates the series of decisions the Mayor will make regarding the City's storm preparations; its modular format allows City agencies to tailor operations to the conditions of the emergency and to maintain flexibility. The Office of Emergency Management (OEM) leads periodic reviews of the CSP; the last significant revision occurred in 2007, and significant adjustments were also made following an after action review of Hurricane Irene in 2011.

Hurricane Sandy hit New York City on Monday, October 29, 2012. Starting several days before the storm, Mayor Bloomberg convened daily executive-level briefings at City Hall and OEM Headquarters in Brooklyn to receive detailed briefings from agency commissioners and senior staff; the National Weather Service (NWS); agency partners including the Metropolitan Transportation Authority (MTA) and the New York State Department of Health (NYS DOH); and others. These briefings, along with worsening weather forecasts, led OEM to activate the Emergency Operations Center (EOC) on Friday, October 26, which became the nerve center for storm response management. The Mayor held the first of many daily press conferences to update New Yorkers the same day. Based on the storm's trajectory and strength on that date, OEM also opened the Logistics Center (LC) to provide supplies, equipment, and other resources to responding agencies. In accordance with the CSP, OEM activated the Healthcare Evacuation Center (HEC) at OEM to prepare for the possible evacuation of healthcare facilities; and the Emergency Supply Stockpile was activated to provision the City's emergency shelter system in the event of an evacuation. A key decision—whether to issue a mandatory evacuation order—was made following updated storm surge predictions from the National Weather Service on the morning of October 28.

Following the storm, the geographic scope and extent of the damage in the hardest hit areas required neighborhood-level decision making to ensure that community needs were being met. Mayor Bloomberg appointed senior staff members as borough recovery directors to work in each neighborhood and act as a single point of contact for residents and community groups in addition to dedicated teams of operations staff from across City agencies that worked centrally to meet the most critical needs—generator placements, debris removal, shelter operations, food and water distribution, and many others.

To help understand why people in Coastal Storm Plan Evacuation Zone A chose to evacuate (or not), the City conducted a survey in English and Spanish to ask about New Yorkers' overall awareness of evacuation zones, how they received information about evacuation zones and severe weather, and their confidence in the City's guidance to evacuate or shelter in place. The survey weighed responses by borough, age, and other demographic factors to develop a survey population that was truly representative of residents in Zone A.

The recommendations in this report are the product of working sessions with more than 115 City employees representing more than 25 agencies, as well as consultation with community groups, volunteer organizations, and nonprofit partners about the substantive areas of the City’s preparations and response to the storm.¹ In addition to the City workers familiar with the most critical response operations as part of their everyday jobs—such as debris removal at the Department of Sanitation (DSNY) and dewatering at the Department of Environmental Protection (DEP)—thousands of City employees whose primary jobs do not include emergency management provided staffing and logistics support in temporary storm-related work assignments. The Mayor’s Office conducted an anonymous survey of more than 330 of these employees to solicit their input about (i) how to improve core response and recovery operations; and (ii) to

ensure that the processes for getting response resources are user-friendly and can be easily scaled to the size of an emergency with support from a wide range of City personnel.

The recommendations in this report are designed to strengthen the City’s overall preparedness and to put the building blocks in place for a thorough and organized response to an extended emergency event that impacts thousands of New Yorkers. The recommendations in this report also focus on the ways the City can improve emergency response to help New Yorkers resume their lives and get back to work. The Mayor’s Office and City agencies are already working on the plans, legal reviews, strategic purchasing, and other measures necessary to implement these recommended actions.

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The after action working sessions and discussions with partners generated 59 recommendations in six core areas: (i) communications; (ii) general and healthcare facility evacuations; (iii) public safety; (iv) general and special medical needs sheltering; (v) response and recovery logistics; and (vi) community recovery services. A seventh section, “Ongoing Recovery,” is also briefly addressed at the end of the report; it is necessarily preliminary because the City’s response to Hurricane Sandy remains ongoing and will continue as the neighborhoods most impacted continue the hard work of recovery.

The basis and content of all 59 recommendations follow below; in brief, they can be grouped into seven themes, as follows:

- I. Improved evacuation, including updated evacuation zones and better, clearer communication to help New Yorkers understand how to protect themselves from the risk of severe weather.
- II. Improved accessibility of all coastal storm-related information and services to make them available to all New Yorkers, including persons with disabilities or special medical needs, homebound populations, non-English speakers, and undocumented immigrants.

- III. Better integration of the City’s data across platforms and agencies to increase situational awareness and allow more targeted, efficient response and recovery operations.
- IV. Additional capacity to respond to large-scale building inundation and loss of power, including pre-storm identification of the equipment and skilled resources likely to be needed for building restoration and better coordination with private building owners.
- V. Better coordination of relief to affected areas and to vulnerable or homebound populations, including more efficient deployment of volunteers and donations to residents and business owners.
- VI. The development of a mid- to long-term housing plan for New Yorkers displaced by damage from coastal storms.
- VII. Partnership with the federal and state authorities that regulate and enforce standards for private companies and utilities that provide essential services to New York City residents.

¹ See Appendix A: List of Participating Agencies and Acronyms.

Communications

By the Numbers

- Between October 26 and November 9, NYC.gov received 4 million unique visitors and 16 million page views.
- Mayor Bloomberg's YouTube channel had nearly 1 million views between October 26 and November 9.
- OEM sent Notify NYC alerts via landline, mobile, text, email, and Twitter to more than 165,000 residents.
- The City sent more than 2,000 tweets and gained more than 175,000 social media followers during the storm, including a 71% increase in followers of the NYC Mayor's Office Twitter feed.

The City has a heightened responsibility to communicate clear, actionable information to the public during emergencies. From the outset of Hurricane Sandy, the Mayor's press office coordinated and acted as a clearinghouse for all storm-related communications to ensure that New Yorkers had access to consistent and prioritized communication.

During the storm, the City pushed out information through as many channels as possible. Major television networks, radio channels, third-party websites, NYC.gov, and the Mayor's Office and Mike Bloomberg YouTube channels carried live press conferences while City Twitter feeds reinforced the most critical messages. The Mayor's press office issued frequent updates on the storm's progress and sent text press releases to their distribution lists that include more than 100 ethnic and community-based press outlets—ranging from Russian newspapers to Chinese television stations to Spanish-language radio. To reach the deaf and hard of hearing community, sign language interpreters

signed all live press conferences and the City actively encouraged major networks to provide closed-captioning during mayoral press conferences. In the past year NYC.gov also underwent substantial back-end upgrades to improve site stability during periods of high demand; between October 29 and October 31, NYC.gov handled 2.3 million visits and 4.8 million page views. Hurricane Evacuation Zone data on the City's open data platform allowed third-party sites to map this information for their viewers and diversified the number and type of sites on which it was available.

In addition to information flowing from City officials to the public, communication from the public to the City via 311 also increased in volume, with a daily average four times greater than the 2012 daily average and peaking as high as 274,000 calls in a single day. Although average wait times to speak with a 311 call-taker increased during Sandy, the automated Interactive Voice Response system, or IVR, resolved 74% of all inquiries within two minutes. 311 Online visits were also seven times higher than the 2012 daily average.

OEM uses an additional set of tools to broadcast information to the general public, including Notify NYC, the City's flagship emergency update system that sends alerts via landline, mobile, text, email, and Twitter to more than 165,000 registered users. Notify NYC's reach expanded by nearly 15% during Sandy, gaining more than 9,600 direct subscribers and another 12,000 to the Notify NYC Twitter account. The City became the first local municipality in the country to use the Commercial Mobile Alert System (CMAS), an emergency text message service created by the Federal Communications Commission (FCC) to send text messages to all equipped cell phones in a designated geographical area regardless of phone carrier service or origin. The City used CMAS three times during Sandy, starting at noon on October 28 after the Mayor announced the mandatory Zone A evacuation and twice on October 29 between 8:30 and 9:30 PM during the height of the storm. The City's Advanced Warning System also reaches special needs individuals through government and nonprofit organizations.

Recognizing the important role that local elected officials play in their communities, the Mayor's Office designated a 24-hour hotline in the Emergency Operations Center for elected officials to report constituent needs and other issues. The Mayor's Office also sent comprehensive email updates to elected officials and community partners frequently before, during, and immediately after the storm—sometimes several per day—and periodically through Thanksgiving. In the absence of power and telecommunications, the City used paper flyers to distribute information through neighborhoods about available food and water distribution points, mobile charging locations, Restoration Centers, Rapid Repairs, and other programs. The NYC logo identified City programs to the public and flyer templates allowed borough and program staff to adapt the information as quickly as necessary.

While many aspects of the City's public communications went well before and after the storm, many challenges arose for which the City can be better prepared in the future. For example, 311 serves as a lifeline to City services and information for residents, businesses, and visitors, and is vitally important to the City agencies and employees that provide municipal services to the public. There was no interruption of 311 service during Hurricane Sandy, but remedial actions should be taken to ensure that the technologies supporting 311 retain the necessary flexibility and functionality to most effectively serve callers before, during, and after citywide events. 311 has contingency plans in place to ensure continuity of service in the event of damage to its infrastructure, which happened during Sandy when Verizon's Lower Manhattan hub flooded from storm surge. 311 activated this contingency plan on October 29 and remained operational throughout the storm. However, the 311 platform and geographic information system (GIS) architecture have limited ability to scale to handle emergency-level call volume, and although 311 has grown to include many customer service interactions from across City agencies since it launched 10 years ago, there are more opportunities to grow call center, online, and mobile functionality through upgrades to the system's underlying architecture.

Recommendations

1. **Further expand capacity of 311 call-taking during emergencies.²**
 - Implement a redundant call routing solution to ensure continuity of 311 call-taking.
 - Establish an alternate location for 311 call-takers.
 - Expand the use of cloud-based mapping solutions to support emergency activity.
2. **Formalize and expand regular updates to elected officials and community partners.**
 - Update and collect the specific documents (PDFs) that are most relevant to the emergency for circulation, including agency documents such as building electrical recertification forms. Develop versions of critical documents for wide distribution that can be read by software used by people with visual disabilities.
3. **Standardize City communications by creating a template for flyers, adaptable logos, standard language, and translations to facilitate faster communications and to ensure that City programs are clearly identified.**

² The City has committed up to \$30 million over the next two years to upgrade the infrastructure that supports the 311 call center's operations including but not limited to the re-architecture of the 311 platform, the implementation of cloud-based mapping, and the creation of an alternative location for call center representatives.

General and Healthcare Facility Evacuations

By the Numbers

- There are approximately 99,000 buildings in the Hurricane Sandy surge zone housing 405,000 residential units and more than 1 million people.
- 26 NYCHA developments – home to more than 45,000 residents – are in Hurricane Evacuation Zone A.
- There are 6 acute-care hospitals, 1 psychiatric hospital, 22 nursing homes, and 18 adult care facilities in Zone A.

Mayor Bloomberg issued a mandatory evacuation of Coastal Storm Plan Evacuation Zone A, including neighborhoods added following Hurricane Irene, on October 28 in response to revised storm surge projections from the National Weather Service. Only the second general population evacuation in the City's history, the evacuation order required 375,000 New Yorkers to leave their homes and communities in advance of the storm. Many residents of Zone A heeded the evacuation order and left. However, thousands of people did not leave the evacuation zone; tragically, 43 New Yorkers lost their lives to the storm.

Healthcare facilities are regulated by New York State, and the State Department of Health and the City Department of Health and Mental Hygiene (DOHMH) worked side-by-side in the Healthcare Evacuation Center at OEM in the days before the storm to prepare healthcare facilities for anticipated storm

impacts. State regulations require that hospitals and nursing homes have a backup power source to allow them to shelter in place and continue services in the event of an outage;³ adult care facilities are not subject to these requirements. The decision to order a general evacuation of healthcare facilities to protect against the potential risks of an approaching storm (or for any reason) must be balanced against the inherent risks of the evacuation itself to vulnerable populations: regardless of whether the storm strikes, the act of evacuating hospital patients and elderly and infirm populations can exacerbate existing conditions and increase mortality rates among those evacuated.⁴ These risks were a substantial consideration before Mayor Bloomberg ordered a general hospital evacuation in advance of Hurricane Irene, and while there were no deaths associated with healthcare evacuations in connection with that storm, the challenges posed by the evacuation were a focus of the City's after action review of Hurricane Irene storm response.

As Sandy approached, the City used the best available forecast data and instructed hospitals in Zone A to discharge those patients who could safely be discharged and to reschedule elective surgeries. New York Downtown Hospital, which is not in Zone A but was at a high risk of losing power, voluntarily evacuated before the storm. Patients at other hospitals in Zone A who could not be safely discharged were instructed to shelter in place, as were those in residential healthcare facilities. Sandy's unprecedented storm surge caused widespread power outages and flooding that ultimately compromised the ability of five hospitals and approximately 30 residential facilities to shelter in place throughout the storm and its aftermath. Those facilities were evacuated and patients and residents were taken to alternate locations, in some cases for extended periods. Although these large-scale evacuations were completed without patient fatalities, several improvements can be made to this component of storm response operations.

³ See 10 NYCRR § 711.3(e)(3) (providing that if a health facility is located in a flood plain, the State health commissioner may require the facility to comply with various requirements, including that the health facility is "designed and capable of providing services necessary to maintain the life and safety of patients and staff if floodwaters reach the one-hundred year flood crest level," and that the facility include "[e]lectrical service, emergency power supply, heating, ventilating and sterilizers"). See also id. §§ 713-1.10(c) (generator requirements); 713-2.22(h) (requirements for emergency electric services); and 405.24(g) (emergency and disaster preparedness requirements for hospitals).

⁴ NYC Health Commissioner Dr. Thomas A. Farley explained this issue further at a recent City Council hearing:

In advance of Irene, all of the hospitals and most of the chronic care facilities in Zone A were evacuated, as instructed by myself [Commissioner Farley] and the State Health Commissioner [Nirav Shah, M.D., M.P.H.] In total, at least 7,000

people were evacuated from these facilities. While these evacuations were conducted safely, it was clear from our conversations with facility operators that they believed the evacuations put their patients at risk.

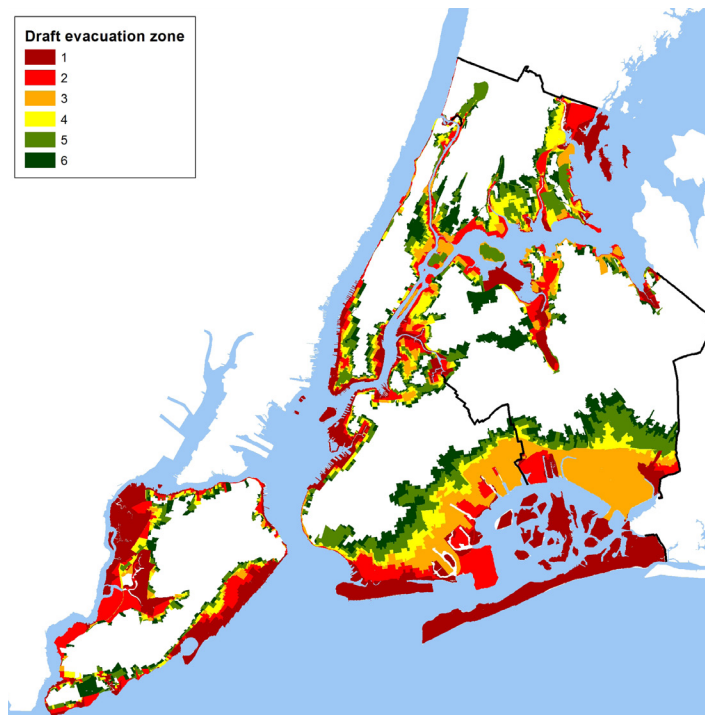
Emergency Planning and Management During and After the Storm: Emergency Preparedness and Response at the City's Healthcare Facilities: Oversight Hearing Before the New York City Council Comms. on Health, Aging, and Mental Health, Developmental Disabilities, Alcoholism, Drug Abuse, & Disability Services (Jan. 24, 2013) (testimony of Thomas A. Farley, MD, MPH, Commissioner, New York City Department of Health and Mental Hygiene) (hereinafter *Farley Testimony*). See also Dosa D, Hyer K, Thomas K, et al. To Evacuate or Shelter in Place: Implications of Universal Hurricane Evacuation Policies on Nursing Home Residents, 13(2) J Am Med Dir Assoc. 190.e1 (February 2012).

General Evacuation

The Coastal Storm Plan (CSP) delineates three evacuation zones, A, B, and C. Zone A includes the City's coastline and low-lying areas most vulnerable to a coastal storm. Under the CSP, Zone A is to be evacuated in the event of a Category 1 hurricane; the Mayor ordered an evacuation of Zone A in advance of Hurricanes Irene and Sandy. Zones B and C cover additional low-lying areas that are vulnerable to more extreme storms (a Category 2 hurricane and above). The zone system in the CSP was developed using Sea, Lake, and Overland Surges from Hurricanes (SLOSH) maps generated by the U.S. Army Corps of Engineers (USACE), and are primarily based on (i) coastal flood risk resulting from storm surge—the “dome” of ocean water propelled by the winds and low barometric pressure of a hurricane; (ii) the geography of the City's low-lying neighborhoods; and (iii) the accessibility of these neighborhoods by bridges and roads. Amended to include City Island, the Rockaways, and Hamilton Beach after Hurricane Irene, Zone A includes 375,000 people and 26 public housing developments.⁵ Sandy's track, including the leftward hook it took that put the City in the direct path of the storm's most dangerous onshore winds and record storm surge, caused inundation that significantly exceeded the boundaries of Zone A.

Before Sandy, the National Weather Service updated its storm surge model to account for bigger and slower moving storms, as well as improved elevation and high tide data; OEM was in the process of reviewing and updating the City's evacuation zones when this storm hit. Based on this updated model and the recommended interpretation of hurricane category, storm bearing, the size of the storm, and other information the City receives from the National Hurricane Center and the National Weather Service before a coastal storm, the City is revising its hurricane evacuation zones for the 2013 hurricane season. The new zones 1 through 6—which will replace Zones A, B, and C—include an additional 640,000 New Yorkers not included within the boundaries of the former zones. The increased number of zones will give the City more flexibility in targeting areas to evacuate in advance of a predicted storm. The map above illustrates the projected new evacuation zones 1 through 6; the City plans to release detailed information about the new evacuation zones in June 2013 and will make this information available to residents on NYC.gov and 311, as well as through additional outreach.

Projected New Hurricane Evacuation Zones



Note: The exact borders of the new Hurricane Evacuation Zones are still being finalized. This graphic represents the proposed Evacuation Zones, which are currently under review. The new zones will be finalized and released in June 2013.

The New York City Housing Authority (NYCHA) has a particular responsibility to provide safe shelter for its residents and to protect its buildings and infrastructure. A recommendation of the Irene after action review was to strengthen NYCHA's communications with the resident population and develop NYCHA-specific evacuation plans to incorporate into the Coastal Storm Plan. In advance of the storm, NYCHA made 33,000 calls to 19,000 families, posted flyers in multiple languages, and worked with the NYPD to make announcements with bullhorns from marked vehicles with flashing lights in order to encourage residents to evacuate before elevators and other building systems were powered down. NYCHA and the NYPD also provided 200 buses to help residents evacuate and continued to transport residents outside of Zone A until it was no longer safe for first responders to be on the roads.

Despite extensive communications before the storm, many residents of Zone A chose not to leave their homes. To gain some understanding of residents' decisions to evacuate or remain in their homes, the City conducted a survey of Zone A residents.⁶ Among the key findings are that prior to the storm, 88% of Zone A residents surveyed knew that they lived in a hurricane evacuation zone, and 78% knew that they lived in Zone A. In addition, 71% of Zone A residents reported hearing an announcement to evacuate from a public official. Yet those who knew they lived in a vulnerable area and received an official instruction to evacuate were only slightly more likely to evacuate than a resident who reported that they did not receive such an instruction (78% vs. 68%).

⁵ Press Release, New York City Office of the Mayor, Mayor Bloomberg Issues Order for Mandatory Evacuation of Low-Lying Areas as Hurricane Sandy Approaches (October 28, 2012), available at <http://on.nyc.gov/QXldWv>.

⁶ The City's polling firm purchased a sample list of all adults identified as residing in the census blocks that compose Zone A. It set quotas by borough and paid careful attention to field the survey evenly and weight by borough, gender, age, and race to resemble the Census 2010 adult population of Zone A. The survey is reliable for understanding the views and opinions of the adult population of Zone A and making decisions based on those opinions. The entire survey is attached as Appendix B.

This suggests that the decision to evacuate is based on more factors than a mayoral order.⁷ The most significant factors contributing to a decision not to evacuate include a belief that the storm would not be strong enough to pose a danger (22%); a belief that the resident's home was sufficiently elevated to prevent flooding (11%); and a general belief that the resident's home was well built (8%). Of those surveyed, 29% reported evacuating after the storm. Among residents who evacuated before or after the storm, 67% evacuated for more than 48 hours, 78% stayed with friends, and 2% stayed at a City evacuation shelter. This survey will become an important tool for refining how the City communicates with residents in evacuation zones not only prior to coastal storms, but year-round.

NYCHA Numbers

- NYCHA made 33,000 calls to 19,000 units, posted flyers in multiple languages, and worked with the NYPD to make announcements with bullhorns from marked vehicles with flashing lights.
- NYCHA employees knocked on 3,436 doors of residents who are mobility impaired or who require life-sustaining equipment as well as the doors of 7,680 seniors in Zone A during the weekend preceding the storm.
- NYCHA and the NYPD provided 200 buses to help residents in zone A evacuate.

Recommendations

4. **Implement the new Coastal Storm Plan evacuation zones and review the City's evacuation procedures.**
 - Develop a building- or development-specific evacuation zone determination for NYCHA properties within the new evacuation zones.
 - Review pre- and post-storm evacuation routes that account for the possibility of road and bridge closures or flooding.
5. **Increase and refine pre-storm communications and education to vulnerable areas, including NYCHA developments, to maximize evacuation in future storms through OEM's Ready New York program and other outlets.**
 - Ensure that communications clearly explain the importance of following an evacuation order or other official instructions.
 - Provide direction on what to bring, such as medications and important documents, and reinforce that people may have to leave home for more than three to five days.
 - Publicize the homebound evacuation system to New Yorkers who cannot evacuate without assistance, clients of the City's paratransit services, and people with disabilities.
 - Coordinate with advertising companies for use of digital billboards to display evacuation and other information.

⁷ The survey found that 44% of these residents had initially remained in place and evacuated after the storm.

Healthcare Facility Evacuations

Many of New York City's medical facilities are concentrated close to the waterfront. From Hospital Row on Manhattan's East Side to the adult care facilities in the Rockaways, coastal storms present a disproportionate risk to an already vulnerable population.⁸ Although hospitals and nursing homes are required by State regulation to have evacuation plans and redundant power capabilities to allow sheltering in place,⁹ the impact of Hurricane Sandy and the duration of the widespread power outage was more than some facilities could bear. Five hospitals and approximately 30 nursing homes and adult residential facilities evacuated during and after the storm, either to other facilities or to Special Medical Needs Shelters (SMNS), a last-resort option when placements at other residential care facilities identified in evacuation plans—which frequently operate near full capacity—are not available. The number of evacuations also stressed patient transportation options and created competition for bed placements in the absence of a regional evacuation plan to coordinate these scarce resources. In total, City and State officials helped safely evacuate approximately 6,300 patients from 37 different healthcare facilities without a single fatality.¹⁰

Following the storm, the City sourced as many generators as possible to protect life and safety and to prevent additional healthcare facility evacuations. However, communications with many facilities was difficult due to power and telecommunications outages and uneven overall situational awareness, which limited the City's ability to address the needs of particular locations quickly. Facilities were repatriated as they came back online, but this process was not as orderly as it should have been

because there are no guidelines for healthcare facilities to re-open after an evacuation, such as a structural certification from the Department of Buildings (DOB), letters from certified contractors to verify essential utility connections, and inspection from the relevant healthcare oversight entity. Overall, there is substantial room for improvement for facilities to harden their infrastructure, improve their plans to shelter in place, and develop plans to safely move patients and their medical charts to appropriate alternative facilities before, during, or after a severe weather event.

Recommendations

6. **Work with the New York State Department of Health to develop and enforce current and new regulations for licensed residential facilities including hospitals, nursing homes, and adult care facilities that require comprehensive evacuation planning and backup power capacity.**
 - Establish protocols that leverage other facilities in the region to avoid reliance on Special Medical Needs Shelters for facility evacuations.
 - Develop a patient tracking system to track evacuees.
7. **Ensure healthcare facilities are equipped with and know how to use alternate means of communication (e.g. satellite phones or radios) that remain functional in the event that power outages and downed landlines make other channels unusable.**
8. **Develop guidelines for healthcare facility repatriation that include all necessary inspections and certifications.**

⁸ According to research undertaken by the NYC Special Initiative for Rebuilding and Resiliency (SIRR), 20% of hospitals citywide, 34% of adult care facilities; 19% of nursing homes, and 11% of other residential facilities are in the 1-in-100 year flood zone or the 1-in-500 year flood zone.

⁹ See *supra* note 2.

¹⁰ Farley Testimony, *supra* note 5.

Public Safety

By the Numbers

- 911 received more than 20,000 calls per hour during the peak of the storm.
- Approximately 2 million New Yorkers were without power immediately after the storm.
- The City deployed approximately 230 generators after the storm to hospitals, healthcare facilities, and public and private residential buildings.
- More than 3,500 traffic signals were down or damaged following the storm.

911 and Emergency Response

The City's 911 emergency call-taking system reached its highest hourly call volume ever—20,000 calls per hour—during Hurricane Sandy and received more calls during one 24-hour period between 3:00 PM on October 29 and 3:00 PM on October 30 than on September 11, 2001 or during the 2003 blackout, the two highest call periods prior to Sandy. Although this unprecedented call volume resulted in average wait times as high as 5 minutes and 30 seconds at the height of the storm, the recently upgraded 911 system functioned as designed and did not fail or drop any calls. Nonetheless, some callers may have received busy signals due to limited capacity of outside phone carriers.

Hurricane Sandy did result in an increase of high-priority calls, including a 37-time increase of water rescues over normal; but the majority of calls were for downed trees and other non-life-threatening emergencies. Mayor Bloomberg gave a press briefing during the night of the storm to remind New Yorkers that 911 should be used only for serious emergencies, and that 311 should be used for all other types of assistance. To assist in recovery and clean-up operations following the storm, the Office of Data Analytics was able to establish a data link between 311 and 911 for calls about downed trees, which facilitated more efficient deployment of resources than in previous storm responses.

¹¹ In addition to these recommendations, the City will shortly release a review of the 911 emergency response system that will make additional proposals to strengthen 911 operations during large, extended emergency events.

Recommendations¹¹

9. **Launch a public awareness campaign that 911 is for emergencies only.**
10. **Improve and strengthen pre-storm messaging about the proper use of 911 and 311 and other resources available to New Yorkers for non-life threatening situations.**
11. **Formalize a protocol to push information about downed trees from 911 and 311 to the Department of Parks and Recreation (DPR) for removal after the initial emergency response.**

Public Safety Operations and Equipment

Days before Hurricane Sandy made landfall, NYPD and FDNY made crucial changes in staffing levels that proved invaluable during and after the storm: NYPD implemented 12-hour tours to maintain staffing levels and FDNY brought in more than 600 additional Fire and Emergency Medical Services (EMS) personnel. Before the storm, NYPD deployed extra staff to flood-prone locations in Evacuation Zone A to conduct home visits, advise residents of the City's evacuation order, notify residents of the availability of various shelters, and distribute pre-packaged food and supply kits. FDNY activated its Incident Management Team (IMT), a team of 50-60 FDNY staff trained in logistics, finance, planning, and command to manage large-scale, complex incidents in New York City and around the country to coordinate the evacuation of homebound and elderly residents that requested assistance through 311 and arranged for transport and relocation of individuals who could not evacuate without this assistance.

During and after the storm, the NYPD Special Operations division and FDNY water rescue teams used prepositioned personnel and equipment in Staten Island, Brooklyn, and Queens to rescue more than 2,200 people. Both departments estimate that hundreds of additional rescues were likely conducted but were not reported. FDNY EMS, along with mutual aid ambulance resources, coordinated evacuations of several hundred patients from Coney Island Hospital, Bellevue Hospital, and NYU Hospital, including patients in critical condition and more than 15 infants in neo-natal intensive care. Once the storm subsided, FDNY and NYPD conducted grid searches of more than 31,000 homes and businesses to locate and assist people in severely affected areas.

While NYPD was able to carry out its life-safety mission, some officers reported that their equipment was not well-suited for flood rescue operations. For example, NYPD patrol commands used flat-bottomed jon boats to conduct many rescues; because these boats do not have motors and require manual rowing or towing, they limit mobility and maneuverability in swift currents. Because these boats are metal, officers had to use extreme caution to avoid downed power lines. The FDNY and NYPD's specialized units more successfully used inflatable boats, which have outboard motors that can operate with only 18 inches of draft and are made of neoprene galvanized rubber that is easily decontaminated and patched. Inflatable boats are generally more maneuverable than jon boats, fold up for storage on a vehicle, and can be easily deployed.

Power outages that began on October 29 posed unique public safety challenges. Immediately following the storm nearly 630,000 Con Edison and Long Island Power Authority (LIPA) customer accounts—more than 1.5 million people—were without power. The storm surge took out Con Edison's electric substations on the Lower East Side of Manhattan, knocking out power from approximately 34th Street south to the World Trade Center. Fallen trees brought outages to approximately 70% of customers served by overhead power lines in the Bronx, Brooklyn, Queens, and Staten Island. Power in the Rockaways was completely knocked out, as was all of Coney Island, and broad swathes of Staten Island's Mid and South shores, Gerritsen Beach, Howard Beach, and other coastal neighborhoods.

Immediately following the storm, light towers for traffic and general neighborhood safety were in short supply, though with assistance from FEMA and the New York State Emergency Management Office, the City eventually sourced approximately 500 light towers that were deployed to affected communities. Light towers not only deterred crime and assisted first responders in rescue operations after the sun set, they also became central locations for communities to exchange information and charge electronic devices.

The NYPD provided traffic management and intersection control in areas without functioning traffic signals for weeks after the storm, though the number of intersections with signals without power immediately after the storm—more than 3,500—exceeded the number of available traffic enforcement agents. The NYPD quickly mobilized 1,200 Police Academy recruits to augment traffic control measures at key intersections. Traffic issues were exacerbated by the fuel shortage that abated as of November 9, when Mayor Bloomberg implemented fuel rationing measures throughout the City.¹² Traffic in severely affected neighborhoods was impacted for weeks following the storm as residents returned and recovery resources and volunteers flowed into those areas.

FDNY performed extensive work to dewater more than 2,700 flooded homes and businesses, remove more than 3,250 trees from roadways, and wash more than 250 streets to remove beach sand and debris. These operations were critical to allowing first responders to maintain life-safety operations and provide access to affected areas for additional relief efforts.

After the storm, NYPD officers were used beyond their crime control capabilities for tasks such as distribution of food and supplies and wellness checks for vulnerable or homebound residents. NYPD officers and School Safety Agents also staffed evacuation shelters to ensure public safety and assist evacuees in obtaining donated food and supplies, filing for FEMA assistance, and addressing other basic needs. In addition to assisting with the distribution of food and other personal items, the IMT distributed nearly 80,000 fire safety pamphlets to address the increase in fires following the storm to tens of thousands of homes in Queens, Brooklyn, and Staten Island (see "Vulnerable Populations and Special Needs" on page 27).

Recommendations

12. **Identify and expedite the purchase of public safety equipment, including additional light towers and inflatable boats.**
13. **Consider alternative power options for traffic and street lights to keep the roadway network functioning to the maximum possible extent during power outages.**

¹² Recommendations regarding the fuel shortage are discussed on pages 18-19.

Power Outages, Generators, and Boilers

As noted above, storm surge and high winds left millions of New Yorkers without power; the inundation of critical infrastructure including the 13th Street Con Edison substation and four LIPA substations, led to an outage greater in extent and longer in duration than what could have been predicted based on the National Weather Service's forecast and surge modeling and experiences in previous severe weather events.¹³

After large portions of the city lost power at approximately 8:00 PM on Monday, October 29, the City deployed as many generators as it could source to meet a demand that exceeded the number of requests from any other incident.¹⁴ In addition to City facilities, including hospitals and public housing, private facilities that did not have generators or where generators failed turned to the City for assistance. The City established an inter-governmental generator and boiler task force comprised of the Mayor's Office of Long-Term Planning and Sustainability, OEM, FEMA, and the Army Corps of Engineers to prioritize placement to locations that needed power for immediate life-safety needs. In total, the City deployed approximately 230 generators to hospitals, nursing homes, large multi-family buildings, and NYCHA developments in the days following the storm. The City worked closely with Con Edison and LIPA to monitor and prioritize power restoration throughout the inundation zone.

Although all evacuation shelters are located outside of Zone A, they remain susceptible to systems outages—including power outages—that extend beyond the borders of the evacuation zone. Seward Park High School in the Lower East Side lost power for several hours on October 29 for this reason. In anticipation of this possibility, schools that are selected as emergency shelters are assessed for generators so that temporary power can be restored as quickly as possible.

13 Prior to Sandy, Con Edison made preparations for the 11 to 12 foot surge at the Battery forecast by the NWS by erecting temporary barriers around installations, including those in the East 13th Street complex. The actual storm surge came into the Battery at 14 feet, exceeding all official forecasts and overwhelming the barriers erected at the East 13th Street complex. The unpredicted surge level flooded five Con Edison substations and four LIPA substations. The network outages caused by the unprecedented substation flooding numbered almost 350,000 customers.

The most common cause of weather-related power outages is damage to overhead lines outside Manhattan (up to approximately 600,000 customer accounts). During Sandy, Con Edison made preparations for power outages in certain areas by de-energizing certain networks, particularly in Lower Manhattan, and portions of the steam system in response to rising storm surge. Sandy's storm surge exceeded the areas where Con Edison took preemptive action, causing additional outages in Manhattan and Staten Island; the LIPA network experienced massive inundation in the Rockaways, which was essentially completely without power following the storm.

14 The City works with the U.S. Army Corps of Engineers outside of hurricane

After the generator and boiler task force met the demand for generators to protect life and safety, the next highest priority for building systems restoration was NYCHA: approximately 80,000 residents in 423 buildings were affected by lost power, heat, and/or hot water. NYCHA staff worked to restore at least temporary services as quickly as possible, though many buildings subjected to saltwater and sand required a significant amount of work to bring them even to this standard.

To expedite power restoration in public housing facilities, NYCHA entered into emergency contracts with electrical contractors to build temporary switch boxes and restore connections to the Con Edison and LIPA power grids. In the 15 days immediately following the storm more than 150 electricians and other skilled trades restored power to approximately 400 NYCHA buildings housing more than 79,000 residents. As a result of these efforts, heat, power, and hot water were completely restored to all NYCHA buildings impacted by the storm by November 18.

Although essential services were ultimately restored, this review concluded that significant steps can be taken to strengthen the City's capacity to more quickly respond to the massive power outages that residents and businesses faced following the storm. As part of its internal post-storm review, NYCHA will research the best practices and work with residents to clearly outline its responsibilities to residents who remain in their homes during a mandatory evacuation and in the event of prolonged power outages in areas that are not evacuated. The City also used contact information from tax records and water accounts to reach out to owners of buildings in the Department of Housing Preservation and Development (HPD) portfolio to hold them accountable to restore buildings to habitability, and where possible, assist them in doing so.¹⁵

season to survey building-specific needs for backup generation at critical facilities based on the type and use of the building; the Army Corps keeps detailed specifications for each assessment, including information about generator sizing, placement, and connections, on record in case of an event that requires a generator to be deployed to that location. Following Sandy the need for generators far exceeded the available supply, and in a number of cases, the generator specifications on record for a particular facility were incorrect based on building use or were out of date. The Army Corps' mission limits its generator assessments to buildings that house services essential to victim survival or public health, public safety and disaster recovery operations, shelters, and infrastructure operations.

15 The NYC Department of Housing Preservation and Development (HPD) is responsible for enforcing the New York State Multiple Dwelling Law and the New York City Housing Maintenance Code. These laws outline the rights and responsibilities of renters and property owners regarding the maintenance of property, including heat and hot water, lead-based paint, window guards, carbon monoxide detectors, bedbugs, basements and cellars, and Certificates of No Harassment for certain types of housing. See NYC HPD, Residential Building Owners, <http://www.nyc.gov/html/hpd/html/owners/owners.shtml> (last visited April 18, 2013).

Recommendations

14. Develop a comprehensive plan to expedite power restoration to multi-family public and private housing.

- Work with building owners to conduct a power needs assessment of mid- and high-rise residential buildings in low-lying areas in the event of a sustained power outage.
- Set standards for power and essential service restoration and require plans from building owners to meet those needs as part of their obligation to provide habitable dwellings.
- Develop power needs assessments for NYCHA developments and set standards for essential service restoration in the event of a sustained power outage and develop a plan to meet those standards.

15. Improve and expand off-season site generator assessments for public facilities.

- Work with the Army Corps to develop criteria and assessment processes appropriate to New York City.
- Expand the list of facilities that receive power assessments to private buildings with City agency tenants.
- Develop a process for facilities, including private residential buildings, to conduct self-assessments following Army Corps methodology.

16. Establish a Dewatering and Generator Task Force and Action Plan to activate in advance of an approaching storm that will collect and use detailed information about buildings in flood-prone areas to expedite recovery.

- Develop a plan to address environmental contamination in dewatering and debris removal.¹⁶
- Develop street siting and permitting criteria for large temporary generators and boilers.
- Identify goods for a strategic stockpile and/or establish emergency contracts for additional critical resources such as generators, boilers, and electrical switchgear.
- To the extent necessary, contract for emergency on-call electricians for generator installation and post-disaster assessments, and for on-call plumbers to install boilers.
- Add generator operations and maintenance and GPS locators to the standard scope of work for generator contracting to help track location and placement in areas with poor communications connectivity.

¹⁶ The New York State Department of Environmental Contamination regulates a hazardous waste management program on behalf of the federal Environmental Protection Agency (EPA), including the State Pollutant Discharge Elimination System (SPDES) that controls point source discharges to public wastewater and stormwater systems. Inundation of building basements may damage building fuel tanks or cause them to leak, introducing the possibility of environmental contamination if the building discharges to the City's sewer system during dewatering.

Sheltering

By the Numbers

- New York City's shelter system housed approximately 6,800 evacuees in 73 shelters.
- 1,200 medical professional volunteers worked more than 1,500 shifts, serving more than 18,000 hours.

The City's evacuation shelter system provides a safe place outside the evacuated area designed to meet evacuees' basic health and safety needs during a coastal storm or other emergency. If fully activated for all evacuation zones, the system can accommodate up to 600,000 people. Eighteen City agencies provide staff to operate shelters, and since 2007, more than 34,000 City employees have been trained to operate or staff shelters. Evacuees who require additional medical care but who do not require hospitalization are referred to specially designated Special Medical Needs Shelters (SMNS).

During Sandy the City opened the first tier of shelters—enough to accommodate the maximum projected 71,000 people who could potentially seek shelter during an evacuation of Zone A.¹⁷ Shelters were ready to accept evacuees as of the morning of Sunday, October 28, more than a full day prior to Sandy's arrival—enough time to allow people to collect their belongings and travel inland while it was safe to do so and before the MTA shut down the subway and bus system. From the opening on October 28 until the City opened other temporary housing options on November 12, approximately 6,800 people sought shelter for some period of time—from a day or two to several weeks. The majority of people seeking shelter arrived by October 30, immediately after the storm passed. On November 2 the City began to consolidate shelter facilities and transitioned the remaining shelter population to other temporary housing options, including hotels, starting November 12.¹⁸

¹⁷ See *Emergency Planning and Management Before and After the Storm: Shelter Management: Hearing Before the New York City Council Comms. on General Welfare, Aging, Health, Oversight & Investigations, and Mental Health, Developmental Disability, Alcoholism, Drug Abuse & Disability Services* (Feb. 5, 2013) (testimony of Seth Diamond, Commissioner, New York City Department of Homeless Services) (hereinafter *Diamond Testimony*). The projections for each tier of shelters are based on a Hurricane Evacuation Study conducted by the USACE and FEMA, including a behavioral analysis to determine the likelihood that people comply with a mandatory evacuation order. While the shelters activated for a Zone A evacuation can accommodate up to 71,000 people, the numbers of residents who actually sought shelter at one of the City's emergency shelters during Hurricanes Irene and Sandy were much lower—approximately 9,500 and 6,800 respectively.

Shelter Logistics and Operations

The Emergency Supply Stockpile, which consists of 5,700 pallets of medical supplies, personal care items, infant supplies, cots, blankets, food, water, and pet supplies, supports the basic needs of people who require a safe place to go during an emergency. The City deployed the stockpile on Thursday, October 26 in anticipation of opening shelters. Following Hurricane Irene the City contracted for additional labor to enable faster deployment of the stockpile and to assist school staff with unloading pallets and bringing the supplies into the shelters. The vast majority of the City's shelters are located in public school buildings that were selected based on geography, accessibility, and general suitability. Although this is potentially disruptive to schools, the City's ability to control shelter sites is an important factor in ensuring shelters are available whenever they are needed.¹⁹ Accessibility accommodations at general evacuation shelters and Special Medical Needs Shelters include interpreters upon request and ramps, and the City continues to review its sheltering plan to ensure that we can provide safe accommodations to any person or family who needs them.

The City's communal shelters are designed as temporary places for people to seek safety and are not intended to provide food and accommodations for longer than three days—a far shorter duration than the time that many people could not return to their homes due to flood damage and the extended power outages caused by Sandy's storm surge. This left many people without access to fresh food because shelters are stocked with Meals Ready to Eat (MREs) and shelf stable food that is intended to be consumed for only a few days. Evacuation Centers also lack resources such as showers and laundry facilities; when possible, the City opened nearby recreational facilities with showers, including the East 54th Street Recreation Center in Turtle Bay, the Sunset Park Recreation Center, and the St. John's Recreation Center, to fill this need. For people who were unable to return to their homes within a few days after the storm, the City consolidated shelters across each borough to larger facilities to enable schools to make necessary repairs, clean the facilities, and prepare to reopen for students.

¹⁸ *Diamond Testimony*, *supra* note 21.

¹⁹ 64 schools were used as part of the City's evacuation shelter system: 10 as Evacuation Centers for evacuee intake and 54 as both Evacuation Centers and shelters. Following Sandy, 43 schools were unable to open when school resumed on November 5 because of extensive structural damage and students were reassigned to temporary class locations while buildings underwent restoration. The storm impacted another 22 schools that either lost power or were used as emergency evacuation sites.

Recommendations

17. **Update and expand the Coastal Storm Plan shelter plan to operate at full capacity for longer than three to five days and develop a plan for rapid transition to shelters or other accommodations suitable for medium-term occupancy by residents whose homes are not habitable and are awaiting repairs or housing placement.**
 - Explore space that is suitable for interim sheltering placements longer than three to five days.
 - Expand food options beyond shelf stable items and Meals Ready to Eat (MREs) to meet diverse dietary needs.
 - Review and amend the Emergency Supply Stockpile as needed with additional supplies.
 - Develop a plan for shower and laundry facilities, including accessible showers, for people who remain in shelters.
18. **Improve shelter accessibility for all New Yorkers.**
 - Improve shelter staff training about disabilities, including training about how to obtain items or services (such as special medical needs cots, sign language interpretation, and large print signage for entrances and restrooms) that may be needed to accommodate people with disabilities.
 - Improve physical accessibility of shelters and provide information to the public regarding the accessibility of Evacuation Centers in multiple formats.
 - Make charging stations for wheelchairs and scooters available to people with disabilities.
19. **Develop or improve an application to simply and more effectively track the shelter population, including medical needs, relocations, and other significant issues.**

Special Needs Medical Shelters

New York State has oversight responsibility for residential facilities, including nursing homes and adult care facilities, and has promulgated requirements for storm preparations at these facilities.²⁰ Despite these requirements, many facilities were not adequately prepared for the storm and its aftermath. These facilities need to be better prepared to shelter in place or have adequate, orderly evacuation plans in the event of a storm or other emergency. The City opened eight Special Medical Needs Shelters (SMNS) staffed with medical professionals and administration from the Health and Hospitals Corporation (HHC), mental

health professionals from the Department of Health and Mental Hygiene (DOHMH), medical volunteers from the City's Medical Reserve Corps, and federal Disaster Medical Assistance Teams (DMATs) comprised of 25 doctors, nurses, mental health professionals, and clinical personnel. The City's Medical Reserve Corps, a group of medical professional volunteers organized and managed by DOHMH also worked more than 18,000 hours over the course of the storm.

From October 28 to November 19, the eight Special Medical Needs Shelters served a total of 2,236 evacuees. Among those served were approximately 1,800 residents of chronic care facilities who were unable to shelter in place due to inadequate backup power to maintain a safe environment for residents or other damage to their facilities, and who could not be placed at other nursing homes or adult care facilities.²¹

Some of the most challenging issues during and after the storm arose in connection with providing care to evacuees with special medical needs. The presence of these high-needs individuals, many of whom required prescription medication, had special dietary needs, or required electricity-dependent care, such as oxygen or ventilators, required specialized care and equipment. This included patients transferred from nursing homes and other institutional care settings as well as people in the community—many without necessary medical records or medications. Some of the operational challenges included the disposal of medical waste and providing food that met the diverse dietary needs of this population.

Recommendations

20. **Create a comprehensive management and clinical staffing plan for Special Medical Needs Shelters.**
21. **Although Special Medical Needs Shelters are a last-resort option for evacuating residential healthcare facilities that cannot place their patients into other residential facilities and should be prepared to accept adult care patients from these facilities in the event that alternative accommodations cannot be made, residential healthcare facilities should be required to develop evacuation and placement plans that can be activated in the event of an emergency. The City should work with the state to develop criteria to authorize out-of-county or out-of-state placements as necessary. Only in the event that a facility emergency plan cannot be implemented should these patients be taken to a Special Medical Needs Shelter.**

²⁰ See *supra* Note 2.

²¹ Farley testimony, *supra* note 5.

Response and Recovery Logistics, Utilities, and Infrastructure

By the Numbers

- An estimated 800,000 New Yorkers lost power as a result of Hurricane Sandy; thousands of families in the hardest hit areas did not have power restored for months following the storm.
- Hurricane Sandy generated approximately 700,000 tons of debris.
- 80,000 NYCHA residents in 423 buildings were impacted by the storm.
- More than 25,000 emergency and essential vehicles obtained fuel at three locations through a partnership with federal agencies.
- 37 blocks—nearly three miles—of boardwalk in the Rockaways suffered severe damage.

The wind and surge from Hurricane Sandy affected New York City across the five boroughs: thousands of homes were flooded in neighborhoods along the coast; widespread power outages left people cut off from communications and unable to get basic services; debris blocked roadways and was scattered throughout the inundation zone; and thousands of tons of sand were swept off the City's beaches and into surrounding communities.²² The Department of Sanitation (DSNY), Department of Parks and Recreation (DPR), Department of Transportation (DOT), and Department of Buildings (DOB) played particularly important roles in clearing debris and inspecting housing to allow people to return home, while the Department of Environmental Protection (DEP) worked with the MTA and Army Corps of Engineers to dewater public infrastructure and larger buildings. The Department of City-wide Administrative Services (DCAS) managed the fuel operation

that kept the City's public fleet and first responder vehicles going during one of the most serious fuel shortages in the City's history.

The ability to collect and synthesize accurate data in storm-battered neighborhoods was critical to understanding and addressing the most urgent needs following the storm. In addition to the communications challenges the City faced with respect to nursing and adult care homes (see "General and Healthcare Facility Evacuations" on page 8), the City did not immediately have access to accurate, timely data from power utilities, telecommunications companies, fuel providers, gas stations, and other sectors that provide critical services. As a result, it took a few days—and in the case of telecommunications, longer—to get an accurate, comprehensive understanding of the magnitude of power and service outages at the household level. For example, in order to pinpoint particular high-rise residential buildings in the Rockaways that were without power, the City spent several days working closely with LIPA to build the capacity to extract daily outage data and match it with the information in the City's building database. Using data feeds from Con Edison and LIPA, the City also established daily reporting on electricity outages; the value of these reports varied with the quality of available data and adjustments in reporting conventions the utilities used as they restored their respective utility networks.²³

Some data was immediately available to guide recovery efforts. For example, water usage data immediately before the storm from DEP's automated meter readers (AMR) gave an indication of which households may not have evacuated before the storm. Internet-based applications such as GasBuddy supplemented on-the-ground intelligence from NYPD about fuel availability.²⁴ Overall, however, the City can significantly improve its collection and synthesis of data on the provision of essential services throughout the City, including power, gas, and telecommunications.²⁵ Mayor Bloomberg's recent appointment of a Chief Data Analytics Officer and the Office of Data Analytics will greatly assist in this effort; but the private and utility sectors must be engaged as well.

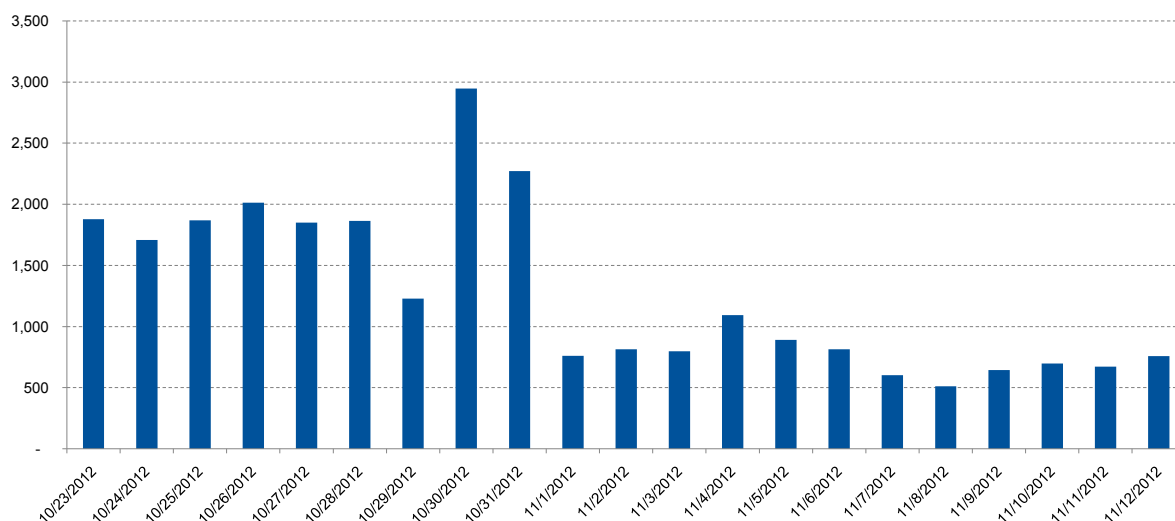
²² See generally Emergency Planning and Management During and After the Storm: Disaster Management: Oversight Hearing Before the New York City Council Comms. on Public Safety, Fire and Criminal Justice Services, Aging, Health, General Welfare, and Mental Health, Developmental Disability, Alcoholism, Drug Abuse and Disability Services (Jan. 16, 2013) (testimony of Caswell F. Holloway, New York City Deputy Mayor for Operations) (hereinafter *Holloway Testimony*).

²³ A sample of the daily report, compiled by the Mayor's Office of Long-Term Planning and Sustainability (OLTPS) is attached as Appendix C.

²⁴ OLTPS generated a daily fuel report based on data from GasBuddy.com, a crowdsourcing website and mobile app that primarily reports real-time gas prices but that also functioned as a real-time snapshot of where gas was available for retail purchase. A sample report is attached as Appendix D.

²⁵ During the course of normal operations, City agencies collect and manage huge amounts of data, from heat complaints at HPD-affiliated residential properties to the condition of trees on public property. The recently established Mayor's Office of Data Analytics is working with agencies to address challenging public safety issues through rigorous data analysis. For example, since the City identified the risk factors with the strongest correlation to illegal building conversions, DOB inspectors have improved the percentage of inspections that find a significant code violation from a historic average of approximately 13% to 70-80% today. See Mayor's Executive Order No. 306 (April 17, 2013) (establishing the Mayor's Office of Data Analytics).

Example AMR data from Belle Harbor in the Rockaways (October 23 to November 12, 2012)



Changes in water consumption data may be due to actual changes in the total consumption of water or the effects of power loss and restoration on the AMR network.

Recommendations

22. **The Mayor's Office of Data Analytics, working with the Department of Information Technology and Telecommunications (DoITT), should develop a comprehensive plan for regular data collection and reporting about essential City services, including electricity, fuel, and telecommunications.**²⁶
 - Work with Con Edison, LIPA, and the City's gas and telecommunications providers to establish continuous, consistent, and reliable data exchanges to drive allocation, distribution, and potential need of emergency resources.
 - Improve agency outreach to affected populations using data analytics.
23. **Bearing in mind the need for cross-agency coordination and information sharing at the property level, the Mayor's Office of Data Analytics will work with relevant agencies to ensure that the City's geosupport system is up-to-date and reflective of granular building-level detail that drives agency disaster and recovery response.**
24. **Resolve inconsistencies in City databases and ensure that all City agencies have access to and operate from the same information.**
 - Develop a template for customer-facing programs and data collection to facilitate real-time intelligence and efficient data collection and sharing.
25. **The Mayor's Office of Data Analytics, the Mayor's Office of Operations, and DoITT should develop a training program for agency staff and other relevant personnel on the availability and use of City data sources.**

Residential and Commercial Building Re-occupancy and Public Infrastructure Restoration

Hurricane Sandy affected New Yorkers' ability to live and work in the City's building stock in two ways: through immediate damage from storm surge and wind and through power outages from damage to electricity, liquid fuels, and water networks. The restoration of homes and commercial buildings required City agencies, utility companies, and private property owners to work together to assess the needs of each property and sequence the work, including dewatering, structural assessment, and generator installation, to ensure everyone's safety and to deploy resources as efficiently as possible. Saltwater inundation of building systems was particularly destructive—NYCHA sourced temporary boilers from as far away as Texas in order to restore heat and hot water to all occupied buildings by November 18.

The Department of Environmental Protection (DEP) and the Department of Transportation (DOT) pumped out many of their own facilities, including wastewater treatment plants, and worked closely with the Army Corps of Engineers and the Navy to pump out the Battery Park Underpass and the West Street Underpass. The Army Corps also assisted in major tunnel and subway pumping operations for the MTA and Port Authority, and many critical parts of the City's transportation network came back online in record time. The City's and MTA's extensive preparations leading up to the storm, including shutting down the subway system to move trains and equipment to higher ground and placing sandbags at vulnerable assets, allowed the City's transportation and wastewater systems to endure the storm with far less damage than would have otherwise been the case.

²⁶ Consistent with its current practice, the City in collecting, sharing and reporting any relevant data related to essential City services will abide by any applicable privacy or similar restrictions imposed by law.

NYCHA Numbers

- NYCHA staff removed 397 elevators from service in 201 buildings in developments in Zone A.
- Approximately 80,000 NYCHA residents in 423 buildings were affected by lost power, heat, and/or hot water.
- NYCHA entered into emergency contracts with electrical contractors to install generators and/or build temporary switch boxes and restore connections to the grid.
- In the 15 days immediately following the storm more than 150 electricians and other skilled trades restored power to approximately 400 NYCHA buildings housing more than 79,000 residents.
- NYCHA used 24 temporary boilers and approximately 100 generators to restore heat and electricity to its facilities.
- Heat, power, and hot water were completely restored to all NYCHA by November 18.
- NYCHA hired approximately 100 cleaning crews to remove garbage, clean stairwells, and wash and sanitize walls and floors of 202 buildings by November 14. NYCHA also inspected all 432 first floor units in the impacted areas and cleaned all units that required cleaning.
- NYCHA knocked on the doors of 24,000 units to inspect for mold and cleaned mold from more than 5,400 of those units.

On Tuesday, October 30, the Department of Buildings (DOB) began conducting structural assessments of residential and commercial buildings in inundated areas. The first round of assessments, called windshield assessments, provided a rough overview of flooding damage and a neighborhood-level baseline from which DOB made building-specific assessments, in the form of either “rapid” assessments or, if necessary, detailed assessments, to categorize homes and commercial buildings as green, yellow, or red – safe, use caution, or structurally unsound, respectively. DOB conducted extensive outreach to homeowners, architects, and contractors, and many homes were reclassified from red or yellow to yellow or green as property owners made repairs.²⁷ From October 30 to November 17, DOB inspectors conducted more than 82,000 assessments in the inundation zone.²⁸

Recommendations

26. **Develop a plan to establish inter-agency teams in advance of a coastal storm or other emergency to conduct building inspections/assessments and standardize inspection surveys to improve data collection and efficiency.**
 - Procure a standing list of engineering consultants to assist in disaster evaluation and reoccupation.
 - Develop mechanisms to notify owners of multi-family buildings of their obligation to maintain habitability before a storm and an assistance and enforcement strategy during the recovery stage.
 - Identify the highest occupancy residential buildings in each type of storm-affected area, such as within the surge zone or utility-side power outage area.
 - Develop a standard survey about building conditions and services to collect post-storm status information and create a process for building owners to answer these questions.
 - Formalize how building inspectors share building status information with social service providers that respond to resident needs.
27. **Improve customer service and self-service options for affected residents to safely reoccupy their homes.**
 - Create or improve the process for utility customers to self-report outages.
 - Improve communication with the public regarding post-storm fire safety and reoccupation of dwellings.²⁹
 - Provide clear communication and guidance on the green/yellow/red placard system and proper steps to remediate a condition and safely reoccupy a residence or business.

²⁷ DOB instituted daily reporting for its inspection activity; a sample is attached as Appendix E.

²⁸ See Appendix E, Sample DOB Structural Assessment Report. See also *Holloway Testimony*, *supra* note 26 (discussing DOB damage assessments).

²⁹ The risk of fire in storm-inundated areas can be significantly increased, particularly if water-damaged power systems are re-energized without proper repairs. These risks should be clearly communicated before and following a severe weather event.

Fuel and Transportation

Sandy triggered one of the most severe fuel shortages in the City's history by damaging energy infrastructure along the regional supply chain, including terminals, pipelines, refineries, and the electricity infrastructure that serves these assets. Although some gas stations were damaged by storm surge, the majority of the City's retail gas stations were not, and with the exception of the Rockaways, did not experience extended power outages; retail gas shortages were a result of not receiving fuel shipments due to disruptions to the regional supply chain.

City agencies had prepared for potential fuel disruptions by fueling vehicles and generators several days before the storm, and the NYPD's ability to maintain an independent fuel supply allowed other City agencies to fuel vehicles in the days following the storm. However, other types of critical vehicles were unable to obtain fuel. Beginning Sunday November 4, the City worked with the National Guard, the federal Defense Logistics Agency, the federal Department of Energy, and the National Park Service to set up a fueling operation at Floyd Bennett Field for City vehicles and other critical recovery personnel. Along with two satellite locations at Fort Wadsworth in Staten Island and Orchard Beach in the Bronx, more than 25,000 emergency and essential vehicles obtained fuel through this partnership. First responders, including private ambulances, also had the option to fuel at 10 Hess stations throughout the City through a partnership managed by the DCAS Chief Fleet Officer with assistance of the NYPD.

For the general public, the City worked with the State to temporarily waive sulfur content requirements for fuel consumption and to ease fuel transportation restrictions into and within the five boroughs. The City also worked with the federal government to suspend the Jones Act to allow tankers originating from foreign countries to supply fuel from refineries along the Gulf of Mexico, and to temporarily waive federal Environmental Protection Agency requirements that are specific to dense, urban environments, allowing fuel consumed outside of New York to be consumed within the city.³⁰

The lack of subway and bus service caused standstill traffic on the City's major roads and highways, leading to gridlock for the general public and interfering with emergency services and the City's recovery operations. To alleviate these conditions, the Mayor issued high-occupancy vehicle (HOV) restrictions on the river crossings into Manhattan on November 1 and November 2. To alleviate persistent fuel lines, on November 9 Mayor Bloomberg issued an odd/even license plate fuel rationing system that remained in place until November 24, when the City's fuel supply infrastructure had been largely restored. Yellow taxi cabs and other vehicles licensed by the Taxi and Limousine Commission were exempt from fuel rationing and HOV restrictions during certain hours, and were encouraged to allow ride-sharing while the subway system was shutdown. Liveries and black car services were also allowed to accept street-hail passengers between October 30 and November 5.

Damage to transportation infrastructure continued to limit mobility even after roads were clear and tunnels dry. The New York City Economic Development Corporation (NYCEDC) launched a temporary ferry service from the Rockaways to Lower Manhattan on November 9; DOT did the same from Staten Island on November 25. At \$2 per ride, these services allowed residents of affected areas with relatively few public transit connections to affordably travel to work and access the rest of the City.

This review made clear that while the City adapted well to the severe challenges posed by the damage Sandy caused to the regional fuel supply, a fuel plan needs to be developed to take the steps necessary to more quickly alleviate the shortages that a storm or other emergency could cause in the future. In particular, the large number of industry participants and stakeholders, the competitive nature of the fuels industry, and relatively lax regulations limited the City's situational awareness of what caused long lines at the gas pumps and how to find a solution for City operations and private citizens. The Mayor's Office of Long-Term Planning and Sustainability (OLTPS) and DCAS relied on professional contacts, crowd-sourced data, and phone interviews to slowly piece together an accurate picture.

30 Waivers were issued of 40 C.F.R. 80 subparts D & E (EPA rule requiring the use of reformulated gasoline blendstock for oxygenate blending, known as RBOB, in New York City and surrounding counties); 40 C.F.R. § 80.27 (EPA rule establishing controls and prohibitions on gasoline volatility); N.Y. Tax Law Art. 12-A (requiring different tax treatment of fuel that is used for transport use versus heating and other off-road uses); N.Y. Env'tl. Conserv. Law § 19-0323 (requiring the use of only ultra-low sulfur #2 oil for heating in buildings in New York City); New York City Administrative Code § 24-168.1(b) (two percent biodiesel requirement for heating oil); and regulations of the Port Authority of New York and New Jersey restricting transportation of flammable liquids through tunnels at tunnel and

bridge facilities. Along with fuel-related requirements, waivers were also issued for 49 CFR Parts 385, 386, 390, and 395 (federal DOT restrictions on commercial-driver hours of service); N.Y. Veh. & Traf. Law § 385 (restricting vehicles of certain heights, weights, and lengths on designated roadways and bridges); and 34 R.C.N.Y. § 4-13 (NYC DOT Rule restricting freight truck vehicle traffic through certain roadways). See also generally, U.S. DOT, Federal Motor Carrier Safety Administration, Hurricane Sandy Relief Efforts - Declarations, Waivers, Exemptions & Permits, <http://www.fmcsa.dot.gov/about/alerts/hurricane-sandy-2012.aspx> (last visited April 25, 2013).

Recommendations

28. Create a Fuel Task Force, modeled after the Downed Tree Task Force (the inter-agency tree removal group), to ensure adequate fuel for rescue and recovery operations.

- Add a fuels desk to OEM's Emergency Operations Center.
- Formalize and expand DCAS/NYPD partnerships with retail gas stations.
- Build federal and state support and create a "playbook" for regulatory relief during fuel shortages.
- Protect and standardize eligibility for use of City fueling sites.
- Research options and viability of creating local emergency fuel reserves.

29. Develop a Citywide Transportation Plan to ensure the liquidity of the transportation system, including the timing and triggering conditions of implementing the plan.³¹

- Outline the conditions to institute fuel rationing.
- Institute HOV restrictions with clear, industry-specific public messaging.
- Ensure that critical responders/critical health and safety staff have an emergency transportation plan, including fueling options where practicable and contingency arrangements in the event of a significant disruption to the fuel supply.

30. Upgrade City-owned fuel infrastructure, including mobile fuel trucks and real-time reporting from the City's 414 in-house fueling locations.

Debris removal

Debris

Sandy generated an estimated 700,000 tons of storm debris, including construction and demolition debris, sand, concrete, and more than 27,000 tons of woody debris from nearly 20,000 downed trees and limbs.³² Clearing this debris from the public right-of-way and from homes was critical to maintaining public safety and facilitating recovery operations. On October 30, immediately after the storm ended, DSNY commenced debris removal operations, working fully-staffed 12-hour shifts around the clock as part of the Debris Removal Task Force (DRTF), which coordinated the collection and removal of debris from the City's rights-of-way to seven New York State Department of Environmental Conservation (DEC)-licensed Temporary Storage Sites (TSSs), including Floyd Bennett Field and Jacob Riis Park, both part of the National Park Service's Gateway National Recreation Area in Jamaica Bay.³³ More than 6,000 sanitation workers collected nearly 110,000 tons of debris in the eight days after the storm and worked at the TSSs to sort large appliances for recycling. From the Temporary Storage Sites, DSNY and contractors hired through the Army Corps of Engineers transported the debris out of the City for permanent disposal.³⁴ DEP monitored debris piles in the Rockaways and Staten Island for asbestos and all samples met the clearance criteria established for asbestos abatements conducted indoors. The Mayor's Fund also sponsored local clean-up teams from the Doe Fund and the Center for Employment Opportunities, two local nonprofit organizations that provide training and employment to unemployed and underemployed New Yorkers.

Five of the temporary storage sites closed by November 19 and two remained open longer to receive remaining debris, including from Rapid Repairs, the City's temporary shelter program to restore power, heat, and hot water to private homes. DSNY continued to work full shifts through November 11 and had up to 2,000 sanitation workers collecting debris daily through March 18.

³¹ Elements of the transportation plan may include the MTA subway and bus systems, yellow taxi and black car services, and other public and private fleets.

³² See *Recovery: Post-Storm Cleanup and the Effects on the City's Health and Infrastructure: Oversight Hearing Before the New York City Council Comms. on Environmental Protection, Health, Sanitation & Solid Waste Management, and Parks & Recreation* (Feb. 28, 2013) (testimony of John Doherty, Commissioner, New York City Department of Sanitation).

³³ The debris temporary storage sites were selected from a pre-surveyed list compiled in 2006 by a multi-agency team comprised of OEM, DPR, NYCEDC, and

DEC. Although the selected storage sites had the capacity to manage the debris from Sandy, the number of approved storage sites has decreased over time as undeveloped properties and large parking lots are redeveloped into housing, parks, commercial buildings, or are designated for other uses that are not compatible with temporary debris storage.

³⁴ Although Army Corps contractors provided significant assistance throughout the debris removal operation, it may be more efficient in future disasters for the City to contract directly for these resources.

Tree Debris

Following the storm, DPR responded to more than 20,000 street tree emergencies received through 311. In addition, the City estimate an additional 5,000 trees were destroyed in parks. DPR hired more than 800 temporary workers, many of whom live in affected neighborhoods, to augment its staff and inspect nearly 2,000 parks and playgrounds to assess damage and clean and remove to make the City's parks safe to open as quickly as possible.

Woody debris from downed trees and limbs is cleared and stored separately from household and other debris because it poses increased fire risks and has the potential to spread Asian beetle infestations. The natural decomposition of wood chips causes temperatures to rise within the debris pile, creating a risk of combustion, which occurred last year during the Hurricane Irene cleanup.³⁵ To reduce these risks, federal requirements mandated that all non-chipped debris must be processed to less than one inch in two dimensions or be destroyed before May 1, 2013. On November 27 the City announced a plan in partnership with the Army Corps to offer tree debris to contractors for conversion to reusable materials, including biofuel, mulch, and landfill cover; as part of the plan, the City and DEC authorized a pilot program to incinerate tree debris as a contingency for quick removal to reduce combustion risk.³⁶

Cars and Boats

Widespread coastal flooding also damaged 10,000 recreational boats and 100,000 personal vehicles, many of which were carried by floodwaters onto streets, sidewalks, and private property. Although the City regularly tows vehicles for parking violations, it did not have a plan to manage a tow operation of this scale. Within 10 days after the storm, the City had put a contract in place to tow and store damaged cars and boats, and had instituted a process for the public to locate and reclaim their property. In total, the City towed approximately 3,400 cars and 180 boats, including 60 derelict boats that washed up on City parks in Staten Island. Finding paved space for car and boat storage, and for additional recovery efforts such as Rapid Repairs staging was a challenge and required City agencies and contractors to compromise on location, space needs, and overall site suitability in order to bring quick relief to affected areas.

³⁵ Press Release, New York City Department of Environmental Protection (DEP), City and U.S. Army Corps of Engineers Convert Tree Debris from Hurricane Sandy for Reuse (November 27, 2012), available at http://www.nyc.gov/html/dep/html/press_releases/12-91pr.shtml.

³⁶ See *id.* DEP air quality modeling based on the best available information showed that incinerating tree debris would have little effect on overall air quality, and during a two day pilot test of the air curtain burning system at Floyd Bennett Field on November 28 and 29, EPA conducted perimeter air monitoring of fine particulate matter (PM_{2.5}), the primary pollutant of concern. Levels of PM_{2.5} measured over a 24-hour period were found to be below the National Ambient Air Quality Standard—a health-based standard for fine particulate matter.

Sand

Another major component of the debris clearing operation was removing more than 2 million cubic yards of sand that Sandy displaced from the City's beaches, including 1.5 million cubic yards on the Rockaway Peninsula alone. Much of this work had to be done by hand, especially in areas such as playgrounds, where heavy equipment would have damaged benches, fences, and play equipment. Working with DEC, EPA, and the Army Corps, DSNY, DPR, and NYCEDC collected this sand from inland areas to clean for reuse as berms, mostly beneath boardwalks, to provide protection from storm surge. Without adopting this beneficial reuse program, the City would have incurred costs of approximately \$270 per cubic yard to dispose of displaced sand, as well as an additional cost of roughly \$80 per yard for new sand to restore pre-storm protections in severely impacted areas, including boardwalks.

Recommendations

31. **Develop contract mechanisms to make the City the primary contracting party for all debris removal resources.**
32. **Develop a car and boat removal plan that can be activated in advance of a storm to expedite the removal of such debris more quickly following a storm or other extreme weather event.**
33. **Identify and secure access to additional debris storage sites.**
34. **Develop a sustainable and cost-effective strategy to remove and dispose of woody debris, including beneficial reuse and incineration.**
35. **Create a plan to remove debris, including hazardous materials, from wetlands.**
36. **Implement proactive air monitoring near debris sites where necessary and an environmental health and safety (EHS) program for City employees near debris sites that have not previously completed EHS training.**

Telecommunications

The 14-foot storm surge at the Battery and the inundation of Lower Manhattan badly damaged Verizon's major telephone infrastructure hubs, called central offices (COs), and high winds and water brought down overhead lines across residential sections of the City. Power outages exacerbated poor service as cellular towers, which are dependent on commercial power and are not required to have backup power, shut down, leaving many parts of the five boroughs without landline, wireless, or internet services for several days. In places where network sites did remain fully operable, some users could not receive service due to overload conditions from a high volume of call traffic.³⁷

In response to this widespread outage, the City worked with wireless providers, National Disaster Recovery teams, and the New York State Department of Homeland Security to deploy mobile cell platforms ("Cells on Wheels," or COWs), cells on light trucks (COLTs), and charging stations to serve both City responders and members of affected communities. The City positioned these resources near central distribution sites and community centers and used paper flyers to maintain communications with New Yorkers who remained without phone and internet service.

The City does not directly regulate telecommunications providers beyond the franchise agreements that enable telecommunications providers to place infrastructure in the public right-of-way. The City will review how it can incorporate improvements to the challenges of severe weather into these agreements and will engage telecommunications providers, legislators, and regulators to provide at least a minimum quality of text and voice service to the public. In many cases, carriers and telecommunications providers will need to invest in equipment and infrastructure networks to meet minimum standards in future Sandy-like conditions.

Recommendations

37. **Work with telecommunications providers to get accurate, regular data on the status of phone, internet, and data availability throughout the City** (see Recommendation 22).
38. **Carrier reporting, pursuant to the Federal Communications Commission's Disaster Reporting Information System, should be a requirement and not voluntary.** The FCC should ensure any relevant information collected that affects a severely-impacted community be shared immediately with first responders responsible for serving those communities.³⁸
39. **Develop a plan along with carriers to pre-stage COWs and other critical telecommunications assets where they could be needed following a coastal storm.**
40. **Work with carriers to extend backup power time at cell sites in flood-prone areas.**
41. **Work with the FCC to establish minimum performance standards for carriers for voice and text messaging services during high-volume call times.**

³⁷ Each carrier manages call volume and bandwidth for its own network.

³⁸ See Statement of Rahul N. Merchant, NYC Chief Information & Innovation Officer (CIO), to the Federal Communications Commission (FCC) Regarding Communications & Hurricane Sandy, PS Docket No. 11-60 (Feb. 7, 2013), [available at](http://apps.fcc.gov/ecfs/document/view?id=7022119157) <http://apps.fcc.gov/ecfs/document/view?id=7022119157>. In his comments to the FCC, CIO Merchant stated the following:

While the City appreciates the informal information sharing its commercial telecommunications carriers have engaged in during and after the storm, it is crucial that any information on outages in an emergency be required as a matter of course, and, at a minimum, be given to first responders in affected

communities at the very moment the information is divined. As such, the City believes that 'carrier reporting,' pursuant to the FCC's Disaster Reporting Information System, should be a requirement and not a voluntary exercise; moreover, that the FCC should ensure any relevant information collected that affects a severely-impacted community be shared immediately with first responders responsible for serving those impacted communities. This information should also be made publicly available to consumers so they may track the status [of] repairs, obtain reasonable estimates as to when service might be restored, and compare performance across competing carriers.

Id. at 9-10.

Community Recovery Services

By the Numbers

- Through January 31, 2013, distribution included more than 2.1 million shelf stable meals, more than 1.5 million prepared meals, nearly 278,000 food truck meals, more than 1 million bottles of water, and nearly 166,000 blankets.
- Approximately 30,000 homes in low-lying areas were contacted through door-knocking operations to identify residents with medical or other urgent needs.
- As of January 20, 2013, relief operations distributed almost 43,000 meals, 11,000 blankets, and more than 3,500 cases of water to people in their homes.
- Up to nine restoration centers served more than 10,000 clients in their first 16 days of operation and received 40,000 client visits.
- The Mayor's Fund raised more than \$58 million in private donations and facilitated approximately \$6 million in in-kind donations from around the country and the world.
- From October 2012 to May 2013, more than 12,000 volunteers have served in communities throughout the City.

Sandy's physical damage to neighborhoods from wind and water, widespread power outages, telecommunications disruption, closure of businesses, and displacement of families disrupted almost every aspect of life for entire communities. In response, Mayor Bloomberg named borough recovery directors to work on the ground and with communities to provide both general services to all New Yorkers in need—food, water, and household items—and individual care to people made vulnerable by medical conditions or isolation.

Sandy also dramatically increased New Yorkers' eligibility for food and housing benefits. Nine Restoration Centers co-located local, state, and federal agencies to bring these services to residents where they live. In addition to the Restoration Centers, the City stood up a mobile field office from an office trailer in Staten Island to allow the borough recovery directors and staff to work directly in and with the community. This mobile office increased situational awareness and lessened the burden of traveling between boroughs while the City suffered from a gasoline shortage and severely impaired telecommunications. Other borough recovery directors created field offices to meet community-specific needs in the weeks after the storm as well.

Recommendations

42. **Formalize the borough recovery director structure and deploy staff to the field sooner after the storm to work with community organizations and lay the groundwork for relief operations.**
 - Create a plan for basic field offices, including furniture, internet and phone access, printing capability, signage, and translation services (either on-site or through Language Line.)
 - Improve capacity for 24/7 mass printing for flyers.
 - Allow borough recovery directors to purchase goods and services to aid recovery.
43. **Use major hubs and distribution centers to share information about all City services to clients, elected officials, and press.**
 - Partner with non-City distribution sites to distribute information about all available services.
44. **Work with FEMA to create flexible criteria for residency in disaster-affected areas in order to allow resident households, including undocumented immigrants, access to federal disaster benefits.**

Food, Water, and Goods Distribution

Sandy left thousands of New Yorkers without the ability to prepare meals and closed supermarkets throughout entire communities. On Thursday, November 1, the City and the National Guard set up a major food and water distribution operation based at Floyd Bennett Field that served 17 community food distribution points on City-owned land, including 11 parks, that ultimately gave out more than 2.1 million Meals Ready to Eat (MREs) and more than 1 million bottles of water. Additionally, the City's Human Resources Administration (HRA) contracted a food supplier to provide 719,000 prepared lunches and hot dinner meals. The Mayor's Fund to Advance New York City supplemented this food distribution by partnering with the NYC Food Truck Association to give out more than 278,000 free hot meals at several locations starting November 6 in coordination with borough Community Recovery Directors and OEM, and by purchasing and coordinating the donation of groceries including fresh produce and nonperishables. Free hot food remained available through local nonprofit organizations and food banks after the City's hot food distribution locations closed and the food truck partnership ended. In addition to major distribution points in affected communities, the City, along with the National Guard and volunteers through NYC Service, worked with NYCHA and our human services agencies to identify homebound populations and deliver food, water, and other goods directly to residents in single and multi-family homes, as well as high-density, multi-family dwellings.

The Mayor's Fund to Advance New York City also purchased and distributed urgently needed supplies including body warmers, warm clothing, baby supplies, and other items. Working closely with City agencies on the ground, the Mayor's Fund was able to identify supply gaps and immediately source and direct items to distribution centers for public distribution. Recognizing that many residents living in tall buildings in affected areas lacked access to running water, the Mayor's Fund paid for portable shower and bathroom facilities at distribution centers, as well as shuttle transportation to make them accessible to residents.

In addition to emergency food distribution, several City agencies provided relief by extending existing services. The Department of Education (DOE) received approval from the federal Department of Agriculture (USDA) to provide free school lunches to all public school students during the months of November and December, and for menu flexibility, and to provide free lunches in Sandy-impacted districts through March. New York State and HRA received a USDA waiver to provide an automatic payment of 50% of the October benefit to Supplemental Nutrition Assistance Program (SNAP) households (put on their Electronic Benefits Transfer (EBT) card) in 82 affected zip codes; 311,000 households received an average benefit of \$140—a total of more than \$43 million. 107,000 households throughout the City also applied for replacement benefits up to the value of the full household grant for October. The average payment for these replacement benefits was \$219 – a total of over \$23 million; some of these households also received the autopayment. Total replacement benefits were \$66 million. HRA also increased its support for Emergency Food Assistance Providers, delivering about 535,000 pounds of food to pantries that serve affected neighborhoods. The Mayor's Fund provided grant funding to City Harvest and the Food Bank for New York City for local emergency food providers such as food pantries and soup kitchens that suffered damage from the storm or provided food relief.

Recommendations

45. **Develop a Food and Water Distribution Task Force and Action Plan to systematize the City's response operations and ensure that they are activated before a coastal storm.** This plan should include:
 - Designation of an NYPD supervisor at each distribution site;
 - A transportation access plan to sites that accounts for emergency road and bridge closures;
 - An on-call contract for hot food providers that the City can activate during emergencies; and
 - An on-call contract for trucks and drivers for distribution.
46. **Identify locations in high-risk areas that may be used as food and water distribution points in coordination with community groups and the NYPD.**
47. **Create a "playbook" of benefit waiver and extension requests for use after future coastal storms or other events that disrupt food and benefit access.**

Vulnerable Populations and Special Needs

Distribution sites and Restoration Centers met the needs of many New Yorkers, but for people who were unable to leave their homes the City launched a door-to-door outreach program. Beginning immediately after Hurricane Sandy, the Mayor's Office and NYC Service coordinated partnerships with nonprofit organizations that deployed volunteers to canvas affected areas.

From November 9 through November 15 the City's Department of Health and Mental Hygiene (DOHMH) led a task force of US Department of Health and Human Services (HHS), FEMA, and the National Guard to knock on doors in high-rise buildings in the Rockaways and on Coney Island. Along with a NYCHA program to provide medical care in Red Hook on November 13, the teams canvassed more than 40,000 residential units and provided food and water to over 1,800 residents, prescriptions and on-site medical care for over 400 people, and evacuated approximately 50 for medical reasons.

A second major wave of door-to-door outreach included the FDNY Incident Management Team and began on November 26 to visit residents of severely damaged single-family homes and multiple-unit dwellings with six or fewer stories in affected areas of Brooklyn, Queens, and Staten Island. On December 8, the outreach operation expanded to include all single-family homes and buildings with fewer than six stories in affected neighborhoods—approximately 100,000 households. The goal of the outreach was to assess overall resident wellness, distribute supplies, provide information about available resources and Restoration Centers, make client referrals to medical teams, and identify homes eligible for Rapid Repairs, the City's free program to restore power, heat, and hot water to individual homes. Between November 9 and January 20, approximately 600 people received medical care at their homes, 1,300 received follow-up assessment from the Visiting Nurse Service of New York, and more than 500 received food through a follow-up visit from the City's Department for the Aging (DFTA.) In total, this effort distributed more than 6,000 blankets, 4,000 electric blankets, 42,000 MREs, 4,000 comfort kits that include items such as toothbrushes and other personal hygiene items, and 390 portable heaters.

In addition to the outreach conducted by the Mayor's Office, the National Guard, OEM and DOHMH, DFTA remained in contact with all 5,015 of its case management clients and HRA reached all of its 3,652 Adult Protective Services (APS), HIV/AIDS Service Administration, and Home Care Services Program clients.

While these operations successfully reached thousands of households and delivered critical services to people with special needs, the review concluded that a plan is needed to deploy these resources more quickly following future coastal storms in a way that more effectively targets high-needs populations.

Recommendations

- 48. Develop a vulnerable populations/homebound door-to-door service Task Force and Action Plan that includes specific operational timelines and leverages community groups and other advocacy organizations, as well as state and federal resources. This plan will leverage the work of the Mayor's Office of Data Analytics and improved staff training to coordinate data collection and sharing.**

Access to Healthcare

The evacuation and closure of several hospitals led to crowded conditions at facilities that remained open, but another far-reaching challenge was addressing continuing treatment needs for people living with chronic conditions in affected communities. To provide basic primary care, the City, working with the State Department of Health, leveraged mobile capacity and voluntary efforts of existing health care providers to bring mobile primary care units into impacted areas. Eleven mobile medical vans offered basic primary care and prescriptions to adults and children in rotating areas in the Rockaways, Brooklyn, and Staten Island based on community needs; these vans provided more than 4,000 visits in the months following the storm. By January 14 more than 600 people had received medical care at their home during a visit from the National Guard and another 1,100 received follow-up assessments from the Visiting Nurse Service of New York.

The City also partnered with pharmacies in affected areas to help them reopen or provide mobile resources as quickly as possible, and to waive prescription co-pays. A nonprofit organization provided commonly prescribed medications free of charge to the mobile vans and in collaboration with DOHMH, the Mayor's Fund to Advance New York City partnered with CVS and Rite Aid to pay prescription co-pays for homebound New Yorkers and deliver the medication to their homes. This collective work helped to address disruption of prescription drug distribution in affected areas—including pharmacies without power, cancelled deliveries, lack of internet, transportation challenges, and service to access patient databases.

Access to methadone services was also interrupted in affected communities, and hospital emergency departments became methadone providers of last resort. Similarly, dialysis providers closed because of power loss and flooding, and in some case dialysis patients came to hospitals for dialysis that could have been provided in a community setting.

Recommendations

49. **Work with the State and pharmacies to develop a comprehensive plan for promoting access and continuity for critical prescription drugs.**
50. **Work with the State to require dialysis facilities and methadone providers to develop actionable emergency plans so that they can continue to provide services during a coastal storm or other emergency event.**

NYCHA Numbers

- 14 of the City's 17 food and water distribution sites were in close proximity to NYCHA developments.
- NYCHA began meal delivery and wellness checks to homebound residents on November 1 and to all residents on November 3.
- On November 13 and 14, NYCHA contacted nearly 50% of households in the Red Hook Houses to deliver food and water, provide on-site medical care by the Visiting Nurse Service of New York, and fill prescriptions.
- NYCHA conducted separate outreach to first floor apartment tenants in the inundation zone and has relocated more than 120 households from damaged apartments to date.
- The Family Services Department has offices in the Red Hook Houses and Haber Houses in Brooklyn, the Ocean Bay Houses in Queens, and at 45 Allen Street in Lower Manhattan to provide residents with referrals to community support services.

Restoration Centers

The City opened Disaster Assistance Service Centers – or DASCs – in the hardest hit areas of the City – Coney Island, the Rockaways, Staten Island, and Breezy Point on Friday, November 2, just four days after the storm. On November 13, Mayor Bloomberg opened the first of a total of nine Restoration Centers, one-stop-shops for city, state, and federal resources for those most impacted by the storm. Restoration Centers saw more than 36,000 visits from opening on November 13, 2012 to the closing of the last three centers in Coney Island, Arverne, and Staten Island on February 23, 2013.

Restoration Centers served personal households and businesses as clients with a focus on financial assistance, housing, and reconstruction. In the financial assistance category, HRA registered new clients for the Supplemental Nutrition Assistance Program (SNAP), the Department of Consumer Affairs (DCA) scheduled appointments at its Financial Empowerment Centers, and the Department of Small Business Services (SBS) referred clients to the Workforce1 Career Centers and business owners to its Business Solutions Centers and helped with applications to the Hurricane Sandy Relief Fund. Housing resources included short-, medium-, and long-term solutions that ranged from hotel placements and emergency transfer vouchers for Section 8 residents to registration with the HPD Portal, which connects households that need shelter to available rental units in the HPD portfolio. Homeowners accessed information about building cleanup, demolition, debris removal, and reconstruction, as well as guidance on mold removal and how to hire reputable and licensed contractors. Rapid Repairs was one of the most requested services and enrolled more than 17,000 homeowners across all methods of registration. The number of clients for each of the recovery services offered varied across Restoration Centers based on neighborhood characteristics.

The City contracted with community-based nonprofit organizations to provide case management services, including client intake, help navigating the services within each Restoration Center, exit interviews, and referrals to additional services available in the community.

Restoration Centers operated out of permanent structures, such as office spaces, storefronts, and semi-permanent structures such as trailers depending on the availability of space in neighborhoods selected by the City's borough recovery directors. DCAS and OEM provided initial logistical support to clean, outfit, and secure each space as necessary and until FEMA or the landlord assumed security, maintenance, and custodial duties. Agencies also contracted with and trained additional client-facing staff to ensure consistent representation across the nine centers as agencies resumed normal citywide operations after the storm.

Recommendations

51. **Create a Restoration Center operations plan that streamlines and clarifies roles and responsibilities for site maintenance, custodial services, and security.**
52. **Establish a data collection and tracking system to guide continued Restoration Center operations and other hurricane recovery programs.**
53. **Conduct a preliminary needs assessment in each storm-impacted community prior to the activation of Restoration Centers to determine the community's greatest needs and tailor the available services to these needs.**
 - Work with partner organizations to focus their scope of services on the most critical community needs that are distinct from immediate food, water, and other material goods needs.
54. **Ensure accessibility of Restoration Centers for all New Yorkers.**
 - Formalize a program that would make American Sign Language interpreters available at Restoration Centers within 24 hours notice or less.
 - Make charging stations for wheelchairs and scooters available to individuals with special needs.

NYC Service Coordination of Volunteers and Donations

Hurricane Sandy demonstrated the generosity of New Yorkers to their neighbors, and of communities around the world. Donations—that ranged from cleaning supplies to food to monetary contributions—allowed the City to address material needs of New Yorkers whose homes and businesses were destroyed or severely damaged. Volunteers, including the NYC Community Emergency Response Team (CERT), corporate groups, individuals, and community organizations knocked on doors, mucked out homes, cleaned up parks, and staffed grassroots neighborhood distribution centers. New York City's network of community-based organizations played a crucial role in the mobilization of volunteers in response to Sandy; new groups also formed to address the vast needs of the City's residents. NYC Service played a central coordinating role with these efforts and with other service organizations and provided logistical support, including meeting locations, transportation, training, and t-shirts to identify the City's volunteers. From November 1 through December 21, more than 11,000 volunteers, including nearly 8,000 volunteers who cleaned up the City's parks, beaches, and recreation centers and who collected more than 22,000 bags of debris. Volunteers also helped distribute more than 946,000 prepared meals and more than 2 million MREs. On November 10, NYC Service hosted a Day of Service with more than 1,000 volunteers. Since January, more than 1,500 volunteers have worked on nearly 50 projects related to ongoing recovery.

The primary challenges posed by the volume of donations and volunteers were how to effectively deploy teams of people and goods to areas that most needed assistance, and how to collect and distribute large quantities of many types of goods at locations across the city. One challenge was the abundant generosity of unsolicited donations—particularly clothing—that accumulated in neighborhoods and were susceptible to the elements and sanitary concerns. The City worked with several nonprofit partners to manage certain types of material donations, but it remained difficult to manage the quantity of these donations and maintain a safe environment for volunteers and recipients. Mayor Bloomberg strongly encouraged monetary contributions to the Mayor's Fund to Advance New York City to maximize economy of scale by allowing the purchase of relief supplies in bulk. The Mayor's Fund also worked with large companies to coordinate significant in-kind donations such as new, packaged items and food.

Recommendations

55. **Expand NYC Service's emergency preparedness plan that pre-identifies partners with the capacity to manage volunteers in various roles on a large scale and across multiple affected areas.**
- Include a volunteer transportation plan and align transportation with volunteer briefings.
 - Draft a communications and protocol plan with volunteer organizations that includes designated points of contacts at each organization and procedures for volunteer recruitment and deployment.
 - Improve communications outside of hurricane season about GoPass, the City's screening process for volunteers to allow them to work in sensitive environments and with vulnerable populations.
 - Draft policy and procedures on information sharing with volunteers to fill roles effectively.
56. **Build relationships with major retailers to identify specific supplies needed in the wake of a disaster.**
57. **Update and expand the City's unsolicited donations plan that identifies a nonprofit organization or a private contractor to manage the intake and distribution of material goods.**

Business Recovery

In addition to providing a safe home for New Yorkers through Rapid Repairs, food, and other critical items, the City launched a set of programs to help businesses recover from both physical damage and losses from extended closures. Citywide, 23,400 businesses with approximately 245,000 employees are located in flood-impacted areas, 95% of which are small- and medium-sized enterprises that employ 50 people or fewer. These businesses faced extensive damage from loss of inventory, ruined equipment, damage to the interior of their space, and structural damage to building systems.

To help businesses throughout the city recover from the storm, the City offered financial assistance, regulatory assistance, and marketing services. NYC Business Solutions is a suite of free services offered by the Department of Small Business Services (SBS) to help businesses start, operate, and expand in New York City that includes legal assistance, staff training, business courses, and more. Following Sandy, NYC Business Solutions worked with more than 2,400 clients on hurricane-related issues. City representatives also worked with community-based organizations and local elected officials to hold dozens of outreach events across the five boroughs.

Business Recovery Zones



Within days of the storm, the City launched an Emergency Loan Fund and matching grant program administered by the New York Business Development Corporation (NYBDC) for businesses that experienced damage due to flooding and power outages. NYCEDC, Goldman Sachs, and the New York Bankers Association partnered to create a \$20 million loan program and a \$5.5 million matching grant program was supported by the Mayor's Fund to Advance New York City and the Partnership for New York City. Qualifying businesses are eligible for up to \$25,000 through a low interest loan that is interest and payment free for the first six months and up to \$10,000 in a matching grant, covering working capital, repairs, and equipment replacement. As of April 23, 2013, more than 620 businesses have been approved for loans totaling almost \$14.1 million, and approximately 380 businesses have been approved for \$3.7 million in matching grants. In collaboration with SBS, the Mayor's Fund provided an additional \$1 million for a mini grant program through NYBDC.

The City, through the New York City Industrial Development Authority (IDA), also issued emergency sales tax letters to waive up to \$100,000 in New York City and New York State sales taxes for up to 250 businesses on materials purchased for recovery efforts. NYC Business Solutions, which offers technical assistance with federal loan applications as a part of their normal expertise, provided this service to help businesses applying for SBA loans. For displaced businesses that could not return to their previous office space, NYCEDC secured more than 250,000 square feet of additional temporary office space across the five boroughs, as well as donated services.

To facilitate the reopening of services, permitting, and inspections, the City announced the creation of Recovery Business Acceleration Teams (RBAT), modeled after the City's New Business Acceleration Team (NBAT), which have helped more than 100 businesses to date. The City also passed a filing and inspection fee waiver for more than 40 permits for repair work or relicensing of affected businesses. The SBS Business Outreach Team's Emergency Response Unit also visited severely impacted areas to assess damages and work with individual business owners to expedite re-inspections, application, and permit processes necessary to reopen; replace lost or damaged City permits or paperwork; work with the New York State Insurance Department to resolve issues; and connect businesses to free legal services and tax abatements for reconstruction, utility rebates, and other incentives.

Finally, the City, in conjunction with NYC & Company and private partners, launched the "Support NYC Small Business" marketing campaign that highlights businesses that reopened after the storm and encourages shoppers to visit commercial corridors impacted by the storm. The campaign features subway, print, and bus shelter and phone kiosk advertisements. In addition, the City worked with 1010 WINS to air a daily segment featuring a newly reopened business.

Approximately 55% of inundated businesses were located in five areas of the City: Lower Manhattan, the Brooklyn/Queens waterfront, Southern Queens, Southern Brooklyn, and the East and South Shores of Staten Island. On December 5, Mayor Bloomberg announced the designation of these areas as Business Recovery Zones (BRZs), each with a designated staff member to address neighborhood-level issues and respond to indi-

vidual business needs. As of mid-March, 82% of 11,925 surveyed inundated businesses had reopened. Examples of work in the Business Recovery Zones include: coordinating the reopening of Coney Island amusements on March 24; launching retail market assessments and creating collective marketing campaigns; working with merchants and local development corporations to form associations in BRZs without existing organizational capacity; the development of neighborhood-wide marketing campaigns; and addressing quality of life issues.

Recommendations

58. **Formalize the post-Sandy business recovery plans into a "playbook" for faster deployment after future coastal storms and other natural disasters, including:**
 - The functions of the Recovery Business Acceleration Teams (RBAT) and Business Recovery Zone staff;
 - Emergency sales tax waivers for costs associated with rebuilding and reopening;
 - Central coordination of in-kind donations, including the use of office space;
 - Marketing and publicity strategies to promote businesses that have reopened in severely affected areas; and
 - The business loans and grants program.
59. **Create standard messaging with a focus on immediate post-storm activities to ensure that businesses quickly receive information on how to access basic services and secondary messaging on financial assistance.**

Ongoing Recovery

New York City's recovery from Sandy will continue as long as there are New Yorkers who are displaced from their homes and businesses, and until neighborhoods have fully recovered from the storm. At the time of this report the NYPD still maintains a contingent of more than 125 officers assigned to storm-affected areas 24 hours a day.

Housing: Hotel Program and NYC Rapid Repairs

Hurricane Sandy destroyed approximately 230 homes across Brooklyn, Queens, and Staten Island, significantly damaged approximately 390 more, and damaged or disrupted essential services to approximately 8,500 more, creating a need for 150,000 New Yorkers to seek temporary housing or immediate home repairs. For those evacuees who remained in emergency shelters but were unable to return to their homes, the City entered into agreements with hotels to provide alternative stable, short-term evacuation sheltering. Mayor Bloomberg appointed Brad Gair director of the newly created Mayor's Office of Housing Recovery Operations (HRO) to design and implement housing strategies beyond hotels and emergency fixes through Rapid Repairs.

HRO created the Hotel Operations Desk, staffed with personnel from HPD, the Department of Homeless Services (DHS), and the Mayor's Office to reserve hotel rooms and place families into them. DHS transitioned remaining evacuees from shelters to hotels beginning November 12, with additional incoming referrals from the National Guard's door-to-door outreach program and from nonprofit providers at public evacuation shelters through November 19. DHS providers delivered on-site case management services at the hotels to connect evacuees to City or federal benefits and work with households to develop a longer-term plan for permanent housing.

A hotel program, along with cash rental assistance and trailer homes, is one of FEMA's frequently used tools to provide temporary housing for displaced residents after an emergency; cash rental assistance and trailer homes were not viable options in New York City's densely developed neighborhoods and expensive rental market. On the principle that the best temporary housing is permanent housing, the City worked with FEMA to create and implement the federal Sheltering and Temporary Essential Power (STEP) program as NYC Rapid Repairs, a free program to restore

power, heat, and hot water to private homes led by Kathryn Mallon, who was responsible for DEP's \$14 billion capital program before joining storm recovery efforts. Rapid Repairs is the first program of its kind in the country and repaired approximately 11,500 homes with more than 20,000 units when it concluded in April 2013. At the peak of the program in January, Rapid Repairs completed work on more than 200 homes per day with labor from more than 2,300 skilled workers in a single day working under 10 prime contractors.³⁹

HRO is working closely with the Special Initiative for Rebuilding and Resiliency (SIRR), which Mayor Bloomberg announced on December 6 and is led by NYCEDC President Seth Pinsky to develop concrete recovery plans for the communities Sandy hit hardest and a specific and comprehensive action plan to prepare the City for the risks of climate change.

Nonprofit Recovery

The City relies on nonprofits to provide a broad range of essential services to its diverse communities. Nonprofits provided services to individuals and communities in the days after the storm and continue to provide critical support. Current work includes assisting individuals and families through the State's Disaster Case Management Program to recover and access essential resources, as well as providing crisis counseling and public education services through the Project Hope Counseling Program.

The City developed a number of initiatives to support New York City's nonprofits in the wake of the storm. This included the November launch of the NYC Nonprofit Recovery Loan Program, a \$26 million bridge loan program, supported by the Mayor's Fund to Advance New York City, the Ford Foundation, Capital One Bank, the Robin Hood Foundation, and the New York Community Trust. The loan program provides interest-free loans ranging from \$5,000 to \$100,000 to nonprofits impacted by Hurricane Sandy and covers losses associated with the disruption of operations and property damage. In March, the Mayor's Fund expanded the Nonprofit Recovery Loan Program to include grant applications. Nonprofits that suffered structural damages and have applied to FEMA are able to apply for grants up to \$333,000; grants up to \$100,000 are available for nonprofits that have suffered tangible losses not covered by FEMA or insurance, such as furnishings, equipment, and supplies.

³⁹ See attached Appendix F: NYC Rapid Repairs Daily Reports.

In addition to these financial resources, the City provided support for nonprofits at the Restoration Centers, hosted briefings attended by more than 500 nonprofits regarding financial reimbursements and FEMA filing procedures, and partnered with the Lawyers Alliance for New York City to provide pro-bono legal assistance in real estate and employment law, government grants and loans, operating disaster relief programs, and insurance coverage.

Collaboration with Mayor's Fund to Advance New York City

The Mayor's Fund to Advance New York City is a nonprofit organization that facilitates innovative public-private partnerships throughout NYC's five boroughs. Immediately following the storm, Mayor Bloomberg announced that donations could be made to the Mayor's Fund to provide direct material relief to people affected by Sandy and to sponsor in-depth assistance programs not otherwise available through city, state, or federal agencies. The Mayor's Fund leveraged online and social media networks, including the Fund's website, Facebook page and Twitter feed, to inform recovering New Yorkers about services available to them, which connected potential service recipients with essential program information. For instance, a partnership with the NYC Food Truck Association relied heavily on social media to inform New Yorkers in impacted areas where they could receive hot meals on any given day. The Mayor's Fund also promoted ways that generous donors here and around the world could contribute to the relief effort, including a text-to-donate program and a variety of independent benefit events. In the six months following the hurricane, the Mayor's Fund raised more than \$58 million from more than 20,500 donors in support of hurricane relief and recovery efforts. Additionally, the Fund facilitated in-kind contributions worth more than \$6 million.

As mentioned briefly in earlier sections, the Mayor's Fund provided key support to the City by fulfilling immediate relief supply needs in affected areas, disseminated primarily through the City's distribution centers. This included 25,000 blankets, 300,000 personal toiletries, prescription medications for homebound individuals, baby supplies, body warmers, and much more. Funds also supported cleaning crews and facilities upkeep for shelters, distribution sites, and damaged outdoor spaces, as well as transportation for supplies, volunteers, and New Yorkers staying in emergency shelters. In addition, more than 333,000 hot meals were provided, including Thanksgiving and New Year's meals, and a partnership with the NYC Food Truck Association that resulted in 278,000 meals alone with as many as 32 trucks dispatched on any given day.

Private funds are also enabling crucial service delivery and resources that complement the City's efforts. For homeowners, mold and water damage have been a major area of concern and confusion, compounded by a lack of direct federal funding specifically for mold remediation. Along with support from the American Red Cross and the Robin Hood Relief Fund, the Mayor's Fund launched a mold treatment program to address mold in homes in the hardest hit areas at no cost to the homeowner. The program is administered by Neighborhood Revitalization NYC (an affiliate of Local Initiatives Support Corporation) and works with private contractors and nonprofit organizations to provide services.

The Mayor's Fund also launched free mold awareness and safe practices trainings and distributed mold supply kits to participants. As of the end of April, more than 1,650 households received or are in the process of receiving services through in the mold treatment program and another 1,100 received mold kits at 54 trainings. Trainings are provided by Hunter College/University of Medicine and Dentistry of New Jersey (UMDNJ) in conjunction with DOHMH and the Mayor's Community Assistance Unit.

To help homeowners navigate the complex rebuilding and recovery process, the Mayor's Fund partnered with the Center for New York City Neighborhoods to sponsor a network of housing counselors and legal service providers to give homeowners in affected neighborhoods access to expert help. A NYC Home Repair Consortium was also created to address unmet repair needs for non-structurally damaged rental and owner-occupied properties that may not be immediately addressed with federal funds. The Consortium is also being supported by the American Red Cross and Robin Hood Relief Fund. The Consortium will be composed of a group of nonprofit organizations that are being selected to scale repair work and serve at least 600 properties.

Since Hurricane Sandy displaced or relocated thousands of students from their schools, and many were cut off from access to a computer or the internet, these factors resulted in significant unanticipated learning gaps for students. The Department of Education, with support from the Mayor's Fund, is providing expanded counseling programs, mentoring, academic support, and afterschool services at 39 schools where students were most impacted by the storm.

New York City's immigrant communities in hurricane-affected areas faced a unique set of challenges. The Mayor's Fund sponsored teams of outreach workers from community-based organizations working in the hardest-hit areas of the City to survey immigrant households about their needs, connect them with services for which they are eligible, and provide information on the City's plans for long-term disaster case management in these communities. This grant is administered by the Mayor's Office of Immigrant Affairs, working with the Federation of Protestant Welfare Agencies. The Mayor's Fund also awarded a grant to the New York Legal Assistance Group to conduct outreach and civil legal services for immigrant communities. The majority of clients are referred from the targeted outreach effort to immigrant families (through the grant to the Federation for Protestant Welfare Agencies); however the services are available to any New Yorker in need.

The above highlights some of the unique partnerships established in coordination with the Mayor's Fund to Advance New York City. A complete list of the Mayor's Fund efforts is available at NYC.gov/fund.

Community Development Block Grant-Disaster Recovery Programs

On January 29, 2013, President Obama signed into law the "Disaster Relief Appropriations Act, 2013" (Public Law 113-2) which provides \$16 billion in Community Development Block Grant Disaster Recovery (CDBG-DR) funds to repair and restore areas affected by Hurricane Sandy.

The City's first round of CDBG-DR funds is \$1.77 billion. The City developed a partial Action Plan ("Action Plan A") that details how it will use this funding to help New Yorkers rebuild their homes, businesses and communities; for this initial allocation, the City plans to dedicate \$648 million for housing programs, \$293 million for business programs, \$360 million for infrastructure and other city services, \$294 million for resilience programs, and \$177 for citywide administration and planning. The City received nearly 400 unique comments from individual New Yorkers, community groups, and other organizations during a two-week public comment period and submitted the revised Action Plan to the U.S. Department of Housing and Urban Development on April 23.



Conclusion

Hurricane Sandy tested the City's ability to respond to a large coastal storm—from providing shelter to residents of coastal areas to removing thousands of tons of damaged trees to providing food and supplies to affected residents. While Sandy was the largest natural disaster to hit New York City in recent memory, it was not the first large emergency incident in the City's recent past and it will certainly not be the last.

While the recommendations in this review outline the City's priority steps to prepare for the next coastal storm, the City cannot safeguard the services that New Yorkers need every day alone. That is why several of the recommendations call on the federal and state governments to partner with the City to create and enforce standards for regulated industries, including utilities and healthcare facilities, to protect customers and patients.

More than anything, the City hopes that the recent memory of Hurricane Sandy inspires New Yorkers to maintain the spirit and state of preparedness and community response that was so critical after Sandy over the long term. OEM's Ready New York program provides online toolkits to help families pack Go Bags, develop a family evacuation plan, and for businesses to learn how to protect the information owners will need to recover from a disaster. NYC Service also partners with OEM to recruit volunteers for emergency preparedness volunteer opportunities through EmergeNYC. Long-term rebuilding will also present New Yorkers with choices about how to adapt to climate change and the risks it presents in their lives: for example, whether to elevate one's home or purchase flood insurance based on updated FEMA flood maps.

Please join us in making sure that New York City is prepared for whatever the future may bring. We welcome your feedback.

Appendices and Resources

Appendix A: List of Participating Agencies and Acronyms

CEO	Center for Economic Opportunity
CAU	Community Affairs Unit
DOB	Department of Buildings
DCAS	Department of Citywide Administrative Services
DCA	Department of Consumer Affairs
DOE	Department of Education
DEP	Department of Environmental Protection
DOF	Department of Finance
DOHMH	Department of Health and Mental Hygiene
DHS	Department of Homeless Services
HPD	Department of Housing Preservation and Development
DoITT	Department of Information Technology and Telecommunications
DPR	Department of Parks and Recreation
DSNY	Department of Sanitation
SBS	Department of Small Business Services
DOT	Department of Transportation
FDNY	Fire Department of New York
HHC	Health and Hospitals Corporation
HRA	Human Resources Administration
MOCS	Mayor's Office of Contract Services
	Mayor's Office of Data Analytics
HRO	Mayor's Office of Housing Recovery Operations
MOIA	Mayor's Office of Immigrant Affairs
OLTPS	Mayor's Office of Long-Term Planning and Sustainability
	Mayor's Office of Operations
MOPD	Mayor's Office of Persons with Disabilities
NBAT	New Business Acceleration Team
NYCEDC	New York City Economic Development Corporation
NYCHA	New York City Housing Authority
IDA	New York City Industrial Development Authority
	NYC Service
OCEC	Office of Citywide Emergency Communications
CECM	Office of Citywide Event Coordination and Management

OEM	Office of Emergency Management
NYPD	New York City Police Department
SIRR	Special Initiative for Rebuilding and Resiliency
	311

List of Other Agencies and Acronyms

	Con Edison
DLA	Defense Logistics Agency
FCC	Federal Communications Commission
FEMA	Federal Emergency Management Agency
LIPA	Long Island Power Authority
MTA	Metropolitan Transportation Authority
	National Guard
NPS	National Park Service
NWS	National Weather Service
DEC	New York State Department of Environmental Conservation
DOH	New York State Department of Health
PANYNJ	Port Authority of New York and New Jersey
	United States Army Corps of Engineers
USDA	United States Department of Agriculture
DOE	United States Department of Energy
HUD	United States Department of Housing and Urban Development
EPA	United States Environmental Protection Agency
	United States Navy

Appendix B: Post Sandy Survey of Zone A Residents

1. Are you 18 years of age or older and a resident of New York City?	Yes	100%	
	No	-	
	Don't know/Refused	-	
2. As far as you know, are you in a hurricane evacuation zone?	Yes	88%	
	No	10	
	Don't know	2	
VOL:	(Refused).....	-	
3. [IF YES] Do you know which hurricane zone you are in? [IF YES] Which one would that be?) [OPEN END]	Yes, A.....	78%	
	Yes, B.....	6	
	Yes, C.....	1	
	Yes, Other	1	
	No	3	
	Don't know	10	
VOL:	(Refused).....	-	
	YES (NET).....	86%	
4. Thinking about Hurricane Sandy, were you...	At home, and did not evacuate when Hurricane Sandy approached.....	63%	
	At home, and evacuated when Hurricane Sandy approached.....	33	
	Not in New York City when the hurricane approached, but not because of the hurricane.....	4	
	Other (SPECIFY).....	*	
VOL:	(Don't know/Refused)	-	
5. [IF EVACUATED] Did everyone in your household evacuate when Hurricane Sandy approached?	Yes	79%	
	No	18	
	Some members of my household evacuated	1	
VOL:	(Don't know/Refused)	-	
6. [IF EVACUATED] What convinced you to leave your home to go to someplace safe? [OPEN END]			
Advice or order by mayor/elected officials	26%	Home located in an evacuation zone	3
Information about the severity of the storm	15	Spouse/partner insisted on leaving	3
Concerned storm would cause home to flood.....	14	Home located in area told by officials to evacuate	3
Advice or order by public safety officials	12	Track graphic indicated the storm could hit.....	2
Advice from National Weather Service.....	12	Advice/order from police officer or fire fighter.....	1
Advice from friend or relative.....	7	Past experience	1
Advice from the media.....	7	Forecast indicated storm would hit.....	1
Concerned strong winds would make house unsafe.....	6	Other (SPECIFY).....	4
Concern electricity would be out	6	Don't know	8
Concerned that storm would hit location	6		

7. [IF DID NOT EVACUATE] Why did you not evacuate? [OPEN END]

Storm wasn't strong enough to pose a danger even if hit.....	22%
Home is elevated above the level of flooding.....	11
Home is well-built	8
Officials didn't say to evacuate	7
Friend/relative said evacuation wasn't necessary.....	7
Had no place to go	5
Home is not located in an evacuation zone.....	4
Home is not located in area told by officials to evacuate	4
Media said evacuation wasn't necessary	4
Wanted to protect property from looters.....	4
No place to take pet/Shelter would not accept pets	3
Forecast said storm would hit a different location	3
Heard conflicting messages from officials whether evacuation was necessary	3
Other information indicated storm wouldn't hit	2
Officials said evacuation was not necessary.....	2
Left unnecessarily in past storms	2
Wanted to protect property from storm.....	2
Track graphic indicated low chance of a hit	2
Evacuation notice from officials came too late	2
Job required staying	2
Medical issues	2
Pets	1
Waited too long to leave.....	1
Had no transportation	*
Other (SPECIFY).....	3
Don't know/Refused	3

8. Did you hear any announcements from public officials saying that you should leave your home to go someplace safer before the storm approached?

Yes	71%
No	28
VOL: (Don't know/Refused)	1

9. Did you evacuate your home after Hurricane Sandy had passed?

Yes	29%
No	70
VOL: (Don't know/Refused)	1

10. [IF EVACUATED] When you evacuated, where did you go?

Friend or family's house	78%
Hotel	7
Left town	3
Public shelter.....	2
Other (SPECIFY).....	7
VOL: (Don't know/Refused)	3

11. [IF EVACUATED] How long did you stay away from your home?

Less than 12 hours	2%
12-24 hours	9
24-36 hours	4
36-48 hours	7
More than 48 hours	67
Still away	5
VOL: (Don't know/Refused)	5
LESS THAN 24 HOURS (NET)	11%
MORE THAN 24 HOURS (NET)	83

12. Thinking about Hurricane Sandy, how prepared were you with adequate food, water and other necessities to survive on your own for three days or more after the storm hit?

Very prepared.....	52%
Somewhat prepared	27
Somewhat unprepared	8
Very unprepared	13
VOL: (Don't know/Refused)	1
PREPARED (NET)	79%
UNPREPARED (NET)	20

13. Since Hurricane Sandy, have you taken any additional action to prepare for a future hurricane or other disaster?

Yes	49%
No	49
VOL: (Don't know/Refused)	2

14. How did your experience with Tropical Storm Irene in 2011 influence decisions you made for Hurricane Sandy as it approached? Did your experience with Tropical Storm Irene....

Make you much more likely to evacuate ahead of Hurricane Sandy.....	12%
Make you somewhat more likely to evacuate ahead of Hurricane Sandy.....	7
Make no difference in the likelihood that you would evacuate ahead of Hurricane Sandy	43
Make you somewhat less likely to evacuate ahead of Hurricane Sandy.....	15
Make you much less likely to evacuate ahead of Hurricane Sandy.....	17
VOL: (Don't know/Refused)	6
MORE LIKELY (NET)	19%
LESS LIKELY (NET).....	32

15. Where did you turn to for information about Hurricane Sandy? [OPEN END]

TV	70%
Radio	34
Internet news	22
Facebook	3
Notify NYC	2
Twitter	1
311	*
Didn't look for information	3
Other (SPECIFY)	11
Don't know/Refused	1

16. [IF KNEW THAT WERE/WERE NOT IN EVAC ZONE] How did you determine whether you were in an evacuation zone? [OPEN END]

TV	36%
Internet	16
Know from previous evacuations	15
Live near the ocean	14
Word of mouth	10
Radio	7
NYC.gov	7
Building management.....	7
New York City first responders such as fire fighters or police officers.....	6
Newspaper	3
Insurance company	1
Notify NYC	1
311	1
Google	*
Other (SPECIFY)	2
Don't know/Refused	4

17. After Hurricane Sandy, how much confidence do you have in New York City's evacuation zone system?

A great deal of confidence	29%
Some confidence	36
Not that much confidence	14
No confidence	15
VOL: (Don't know/Refused)	4
CONFIDENT (NET)	66%
NOT CONFIDENT (NET)	30

18. How much more do you think New York City government could have done to make you or those in evacuation 'Zone A' more willing to evacuate for Hurricane Sandy when ordered to evacuate? Could the government have done....?

A great deal more	29%
Some more	23
Not that much more	21
No more	18
VOL: (Don't know/Refused)	7
MORE (NET)	53%
NOT MORE (NET)	40

19. Knowing what happened as a result of Hurricane Sandy, if you were in New York City and the same situation happened again...would you?

Evacuate	65%
Not evacuate	23
VOL: (Depends)	11
VOL: (Don't know/Refused)	1

20. [IF WOULD EVACUATE] If you would evacuate...would you?

Leave earlier than you did before Hurricane Sandy	70%
Leave at the same time as you did before Hurricane Sandy	19
Leave later than you did before Hurricane Sandy	2
VOL: (Depends)	6
VOL: (Don't know/Refused)	3

21. [IF WOULD EVACUATE] If you would evacuate...would you?

Go to a public shelter	15%
Not go to a public shelter	76
VOL: (Depends)	8
VOL: (Don't know/Refused)	1

22. [IF WOULD EVACUATE] If you would evacuate...would you?

Take public transportation to evacuate	27%
Not take public transportation to evacuate	57
VOL: (Depends)	14
VOL: (Don't know/Refused)	2

23. Do you have pets? [IF YES] What did you do with your pets during Hurricane Sandy? [OPEN END]

No /Don't have pets	65%
Stayed at home with them	21
Took them to our destination with us	11
Left them at home	3
Left them with a friend or family member	1
Left some, took some	1
Other (SPECIFY)	*
Don't know/Refused	-

24. Do you rely on a service provider, such as a visiting nurse, meal delivery, or other home-based care service?

Yes	10%
No	90
VOL: (Don't know/Refused)	1

25. [IF RELY ON SERVICE PROVIDER] Did you rely on this service provider for assistance during and immediately after Hurricane Sandy?

Yes 51%
 No 45
 VOL: (Don't know/Refused) 4

26. New York City government sent several unsolicited text messages before and during Hurricane Sandy to provide residents with information. These messages appeared similar to a text message but may have been accompanied by a loud sound. Do you recall receiving one or more of these messages? [IF YES] How many did you receive?

Yes, two or more 17%
 Yes, one 5
 No 74
 VOL: (Don't know/Refused) 4
 YES (NET) 22%

27. [IF YES] How useful did you find these messages?

Very useful 56%
 Somewhat useful 26
 Not that useful 11
 Not useful at all 6
 VOL: (Don't know/Refused) 1
 USEFUL (NET) 82%
 NOT USEFUL (NET) 17

28. Thinking about Hurricane Sandy, were you personally affected? If yes, how were you affected? [READ LIST]

Lost power for more than one week 56%
 Lost other services 55
 Home was damaged 43
 Had to take extended time off from job 33
 Lost power for less than one week 29
 Car damaged 3
 Other (SPECIFY) 5
 Was not affected 9
 VOL: (Don't know/Refused) 1

Now I would like to ask you a few final questions for statistical purposes only.

D101. What is your age?

18-29 13%
 30-44 29
 45-54 20
 55-64 18
 65+ 18
 VOL: (Refused) 1

D102. What is the last grade that you completed in school?

Some grade school 3%
 Some high school 10
 Graduated high school 16
 Technical/Vocational 2
 Some college 23
 Graduated college 28
 Graduate professional 17
 VOL: (Refused) 2

D300. And just to make sure we have a representative sample of New Yorkers, could you please tell me your race? [IF BLACK/WHITE/OTHER] Do you consider yourself a Hispanic, Latino, or Spanish-speaking American?

Black/African-American 17%
 White/Caucasian 54
 Hispanic/Latino 18
 Asian-American 6
 Other (SPECIFY) 3
 VOL: (Refused) 3

D302. What is the language that is mainly spoken in your home?

English.....	80%
Spanish.....	7
Chinese/Mandarin/Cantonese.....	1
Russian.....	7
Other (SPECIFY).....	5
VOL: (Refused).....	1

D501. Do you live in a single family house, an apartment building or condo building or other multi-family dwelling?

Single family home	28%
Two-family home	14
Three or more units, less than six stories.....	19
Six stories or more.....	38
VOL: (Refused).....	1

D503. How many people live in your household, including yourself?
[RECORD]

One.....	18%
Two.....	26
Three	21
Four	19
Five or more	13
VOL: (Don't know/Refused)	1
MEAN	2.90

Gender [BY OBSERVATION]

Male.....	47%
Female.....	53

Borough [FROM SAMPLE]

Bronx	3%
Brooklyn.....	31
Manhattan.....	27
Queens	22
Staten Island.....	18

Appendix C: Sample Utility Outage Report

Power Outage Update

Current Update: 2012-11-19 0600 AM						Previous Updates		
Borough	Total # of outages currently	Outages outside of flood zones*	Outages within flood zones		Change in total from yesterday morning	Total # of outages previously [11/18, 05AM]	Total # of outages previously [11/17, 0500AM]	Total # of outages previously [11/16, 0500AM]
			Requires customer certification and/or repairs	Customer ready to receive power				
Brooklyn	584	N/A	584	0	-144	728	778	1,287
Queens	480	N/A	480	0	-2	482	500	526
Staten Island	1,106	N/A	1,106	0	-66	1,172	1,539**	300
Bronx	0	N/A	0	0	0	0	0	0
Manhattan	22	N/A	22	0	0	22	22	22
SUBTOTAL - Con Ed only	2,192	N/A	2,192	0	-212	2,404	2,839	2,135
LIPA – Rockaways^	13,949	N/A	13,258	691	-1,766	15,715	18,671	21,789
TOTAL NYC	16,141	N/A	15,450	691	-1,978	18,119	21,510	23,924

Requires customer certification and/or repairs = Utility is able to supply power, but customer must make repairs/provide certification.

Customer ready to receive power = Customer has submitted certification and is on utility's queue for restoration the following day.

*Outages outside of flood zones no longer reported as of 11/13 (all Sandy-related, non-flooded areas have been restored by Con Ed).

** After further review of customer data, Con Ed identified an additional 1,259 outages in Staten Island located outside of the initial flood zone areas, but were affected by flooding and require repairs and certification. Information was verified by canvassing in the field.

^ LIPA –Data reporting is now up to date.

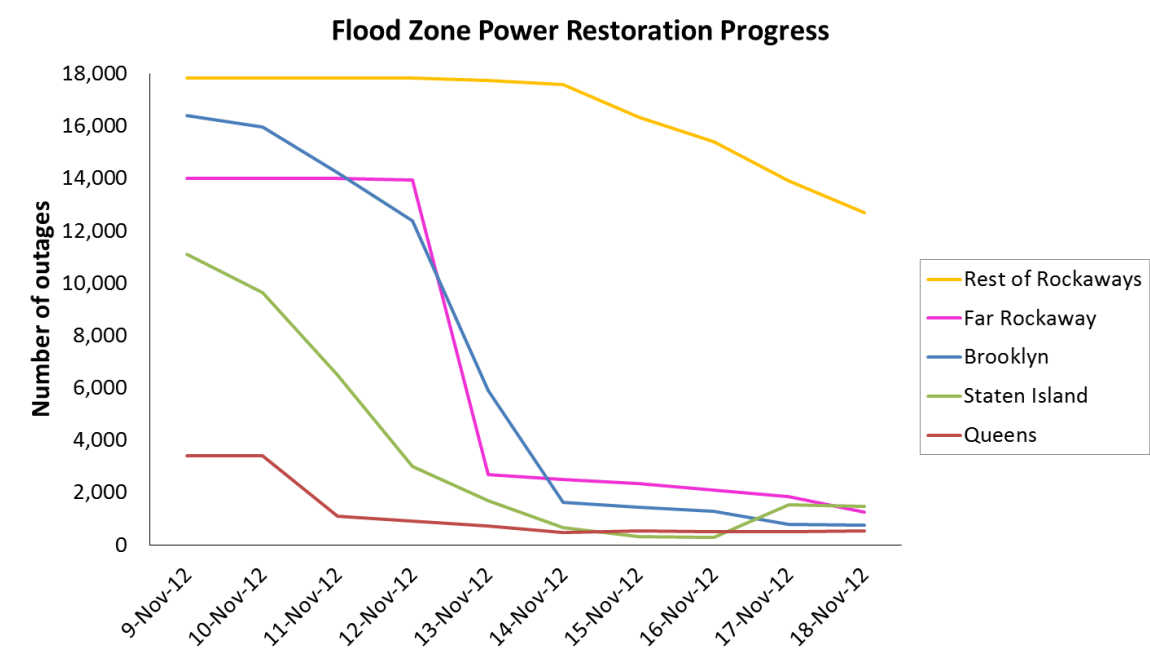
Flood Zone Outages by Neighborhood/Command Post – 11/19, 06AM

Borough	Current outages within flood zones			Initial outage estimates within flood zones			Change from 11/18 05AM	
	Current flood zone outage total	Customer assessed for utility-restoration		Initial flood zone outage total	Customers restored by utility to date	Utility-restoration assessment completed	Change in total outage	Change in # required customer certification or repairs
		Requires customer certification and/or repairs	Customer ready to receive power					
Brooklyn^	584	584	0	16,084	15,500	100%	-144	-144
Gerritsen Beach	290	290	0	2,326	2,036	100%	-118	-118
Brighton Beach & Sheepshead Bay	150	150	0	11,216	11,066	100%	-14	-14
Seagate – Coney Island	40	40	0	1,093	1,053	100%	-3	-3
Manhattan Beach	54	54	0	1,193	1,139	100%	0	0
Red Hook	50	50	0	256	206	100%	-9	-9
Queens^	480	480	0	3,755	3,275	100%	-2	-2
Old Howard Beach-Howard Beach	310	310	0	2,801	2,491	100%	-2	-2
Broad Channel	170	170	0	954	784	100%	0	0
Staten Island^*	1,106	1,106	0	11,460	10,354	100%	-66	-66
Manhattan	22	22	0	22	0	100%	0	0
SUBTOTAL - Con Ed only	2,192	2,192	0	31,321	29,129	100%	-212	-212
LIPA - Rockaways	13,949	13,258	691	31,839	17,890	-	-1,766	-1,063
Breezy Pt & Rockaway Pt & Ft Tilden	2,719	2,601	118	2,811	92	-	-68	-55
Neponsit	362	355	7	601	239	-	-26	-14
Belle Harbor	1,626	1,571	55	2,808	1,182	-	-227	-81
Rockaway Park	1,832	1,727	105	2,915	1,083	-	-160	-61
Rockaway Beach	2,047	1,996	51	2,822	775	-	-163	-37
Arverne	2,367	2,198	169	3,548	1,181	-	-273	-161
Edgemere	1,736	1,579	157	2,325	589	-	-265	-126
Far Rockaway	1,260	1,231	29	14,009	12,749	-	-584	-528
TOTAL NYC	16,141	15,450	691	63,160	47,019	-	-1,978	-1,275

^Neighborhood numbers correspond to areas assigned to Con Edison command posts in each location.

*Includes New Dorp-Midland Beach, Oakwood Beach, Old Town-Dongan Hills, South Beach, Great Kills, Grasmere-Arrochar-Ft. Wadsworth, Charleston-Richmond Valley-Tottenville.

Appendices:



CONED_ACTIVE_FLOOD_111712

As of 11/17/2012,

YELLOW = Neighborhoods with active outages requiring certifications in Con Ed territory.**GRAY** = Neighborhoods that have had customers restored with certifications, no longer have active outages in Con Ed territory.

Neighborhoods are defined by DCP tracts

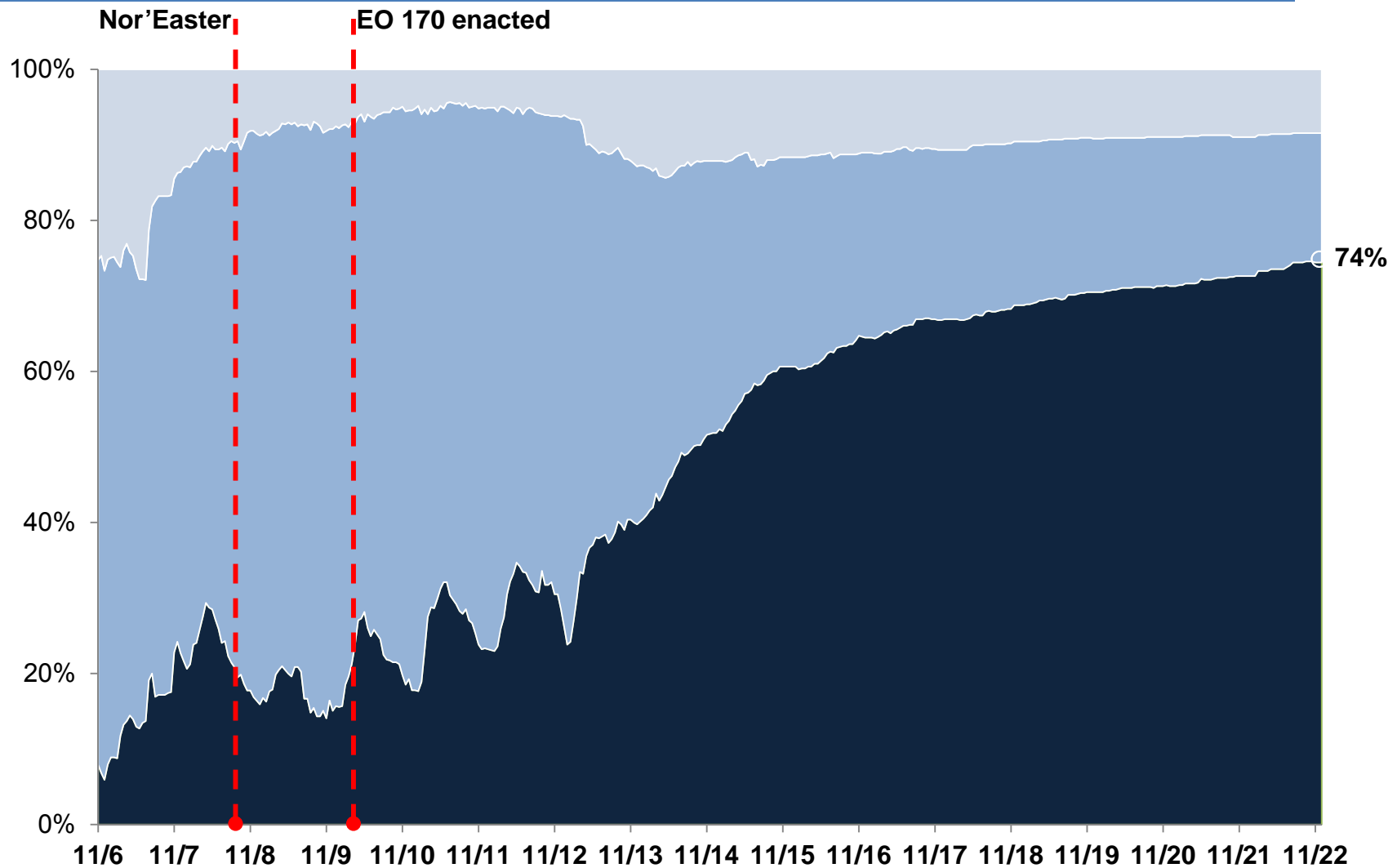
BROOKLYN	QUEENS	STATEN IS
Bath Beach	Broad Channel	Annadale-Huguenot-Prince's Bay-Eltingville
Bensonhurst East	Douglas Manor-Douglaston-Little Neck	Charleston-Richmond Valley-Tottenville
Bensonhurst West	Hunters Point-Sunnyside-West Maspeth	Grasmere-Arrochar-Ft. Wadsworth
Brighton Beach	Jamaica Estates-Holliswood	Great Kills
Brownsville	Lindenwood-Howard Beach	New Dorp-Midland Beach
Canarsie	Middle Village	Oakwood-Oakwood Beach
Carroll Gardens-Columbia Street-Red Hook	park-cemetery-etc-Queens	Old Town-Dongan Hills-South Beach
DUMBO-Vinegar Hill-Downtown Brooklyn-Boerum Hill	St. Albans	Rossville-Woodrow
Dyker Heights		West New Brighton-New Brighton-St. George
East Flatbush-Farragut		Westerleigh
East New York		
Flatlands		
Georgetown-Marine Park-Bergen Beach-Mill Basin		
Greenpoint		
Homecrest		
North Side-South Side		
Seagate-Coney Island		
Sheepshead Bay-Gerritsen Beach-Manhattan Beach		
West Brighton		

Appendix D: Sample Fuel Report

NYC retail gas availability reached 74%; improvement is plateauing

NYC gas stations by point-in-time operational status; hourly snapshots through Thursday 2 AM
Share of total; user-reported data from GasBuddy.com; 810 stations in the sample

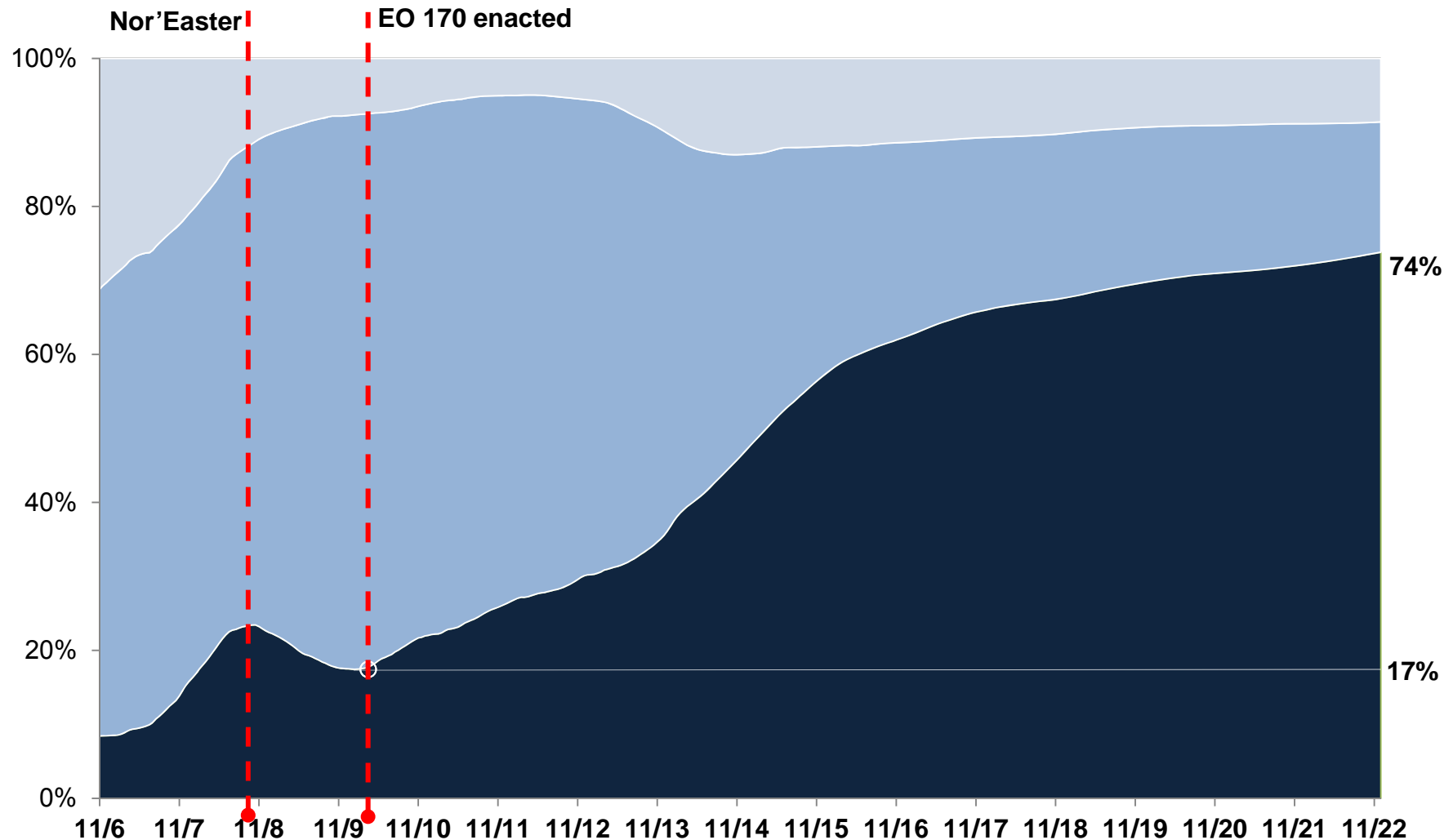
Unknown
No Fuel
Has Fuel



NYC retail gas availability at 74% 24 hr avg; Improvement is plateauing

NYC gas stations by point-in-time operational status; 24 hour rolling average through Thursday 2 AM
Share of total; user-reported data from GasBuddy.com; 810 stations in the sample

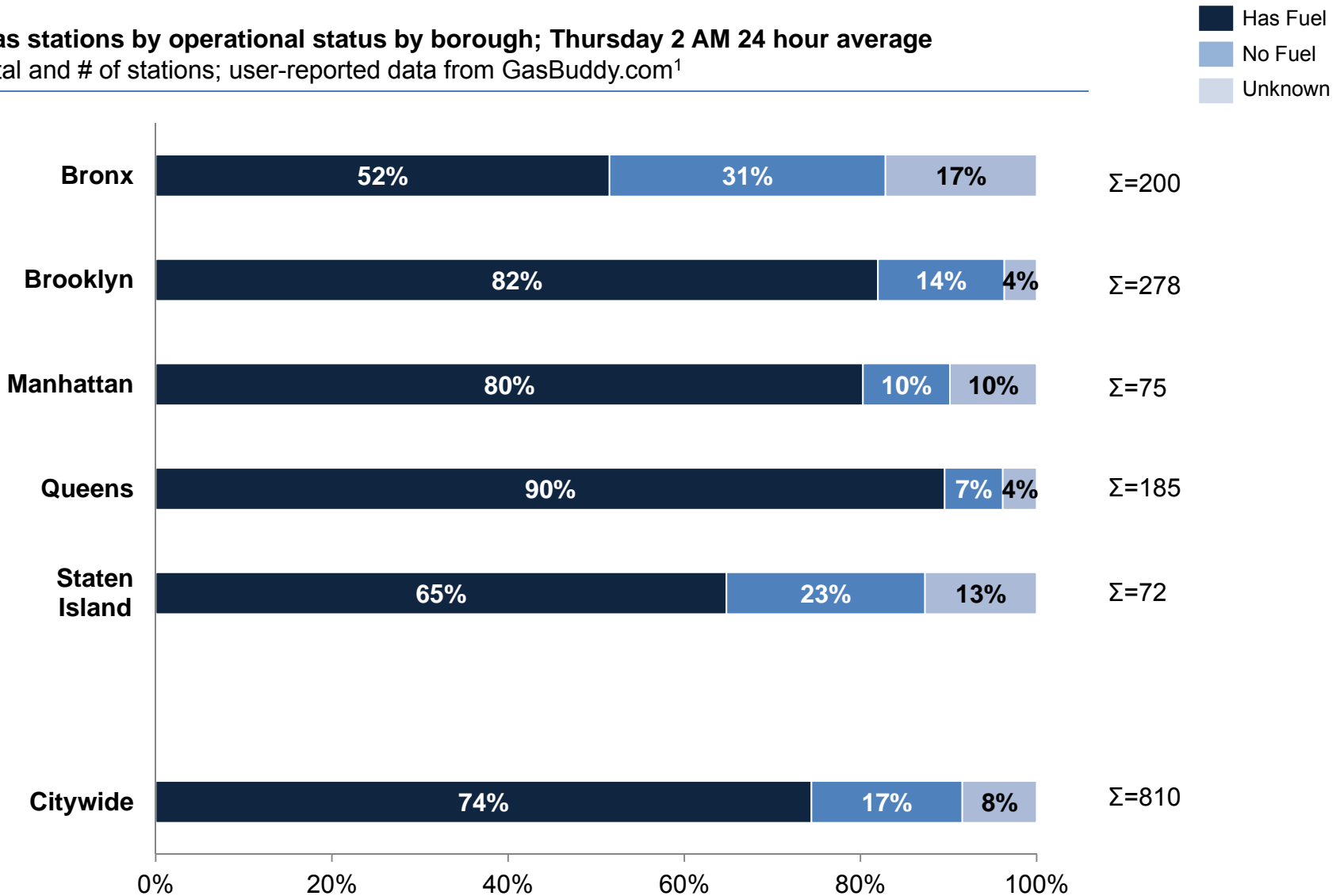
Unknown
No Fuel
Has Fuel



Retail situation appears more constrained in Bronx and Staten Island

NYC gas stations by operational status by borough; Thursday 2 AM 24 hour average

% of total and # of stations; user-reported data from GasBuddy.com¹

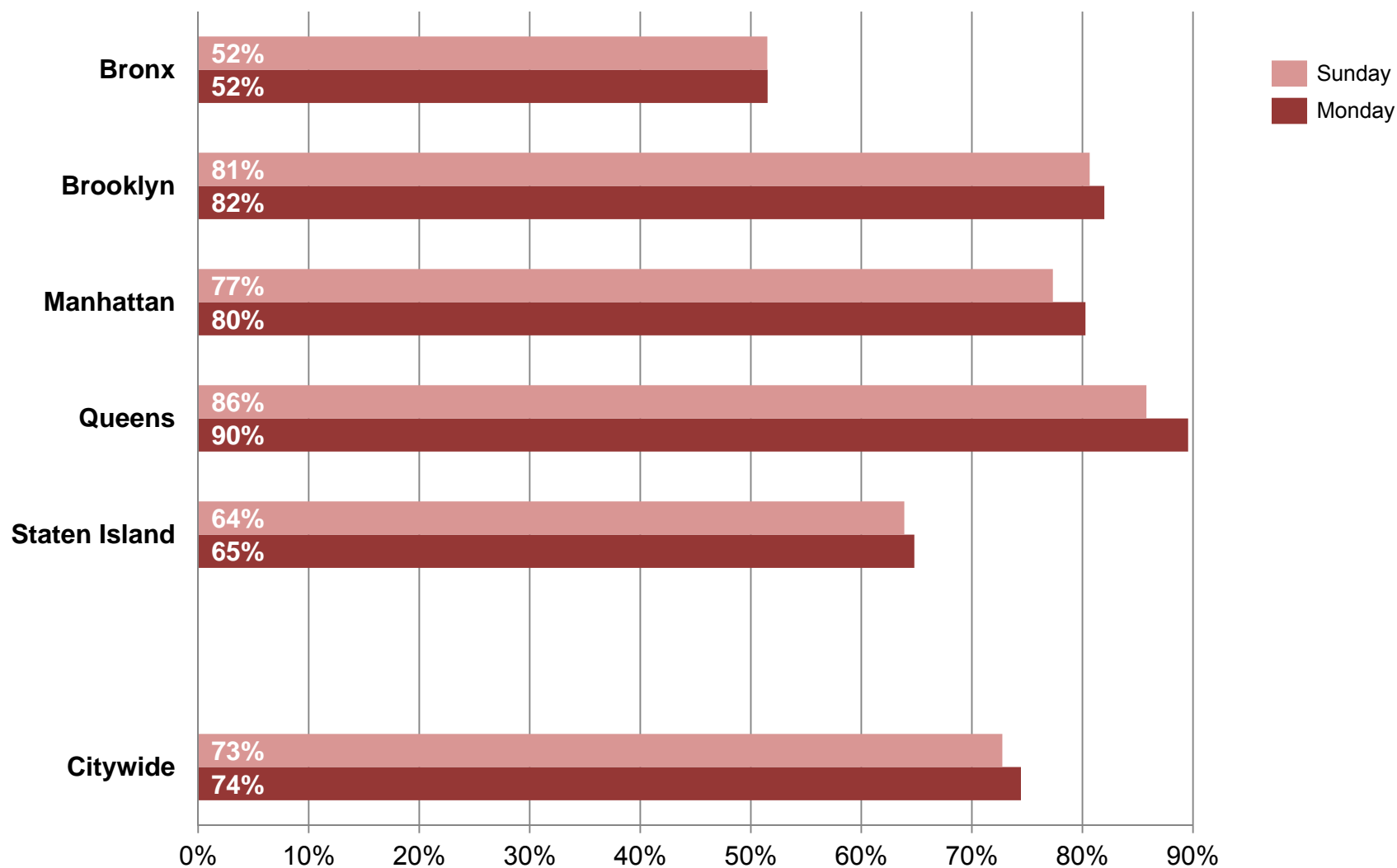


¹ Stations not updated in last 24 hours revert to “unknown”

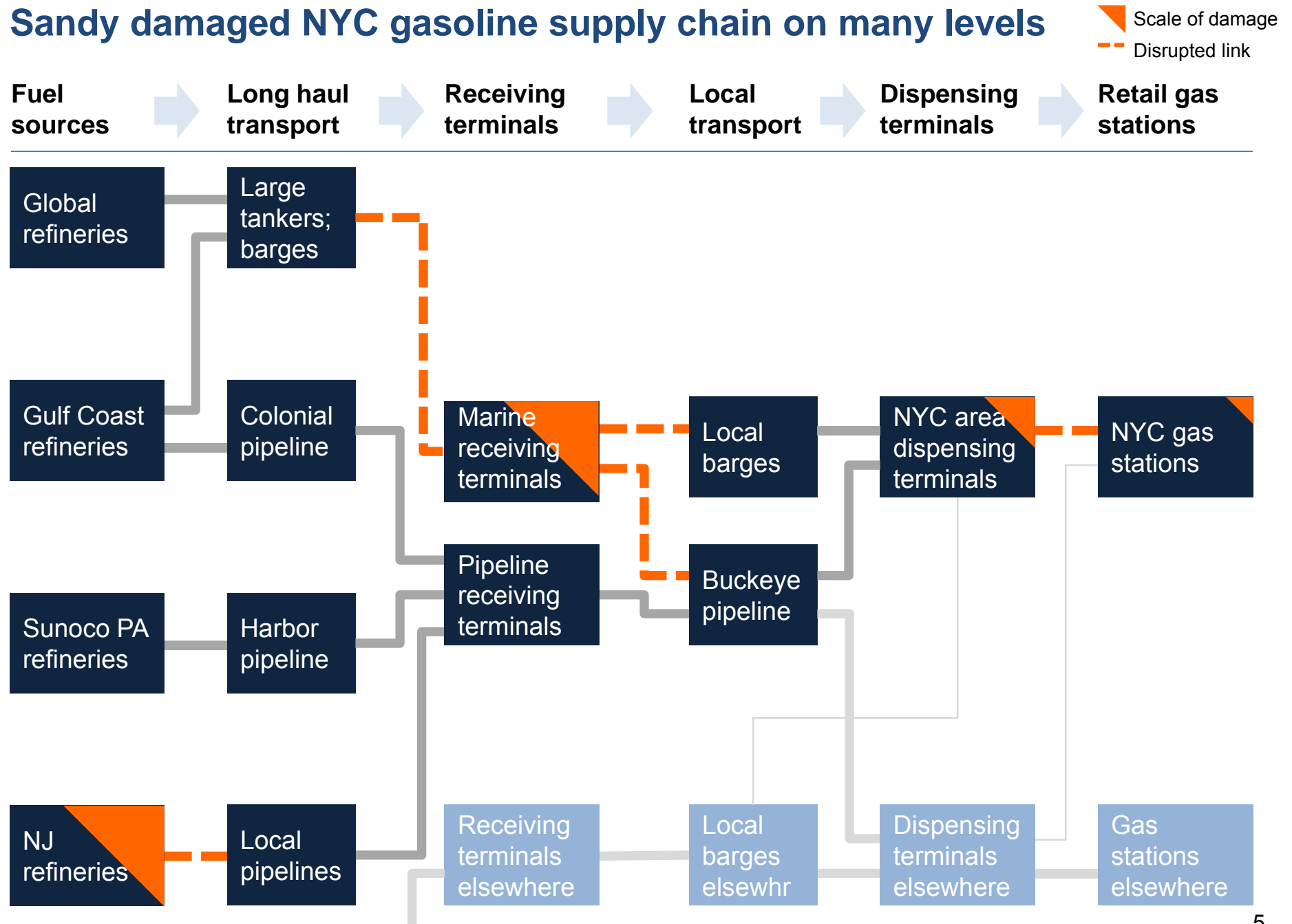
SOURCE GasBuddy.com

Situation in at borough level marginally improved from Monday to Tuesday

NYC stations by operational status by borough; Wednesday vs Thursday 24 hour average
% of total and # of stations; user-reported data from GasBuddy.com



Sandy damaged NYC gasoline supply chain on many levels



Appendix E: Sample DOB Structural Assessment Report

1. Summary of Key Changes from Last Report

- More than 700 Detailed Inspections have been completed citywide
 - 53 Immediate Emergency Declarations, 28 Emergency Declarations and 12 Unsafe Building Orders have been issued
 - 34 Full Demolitions and 13 Partial Demolitions have been ordered

2. Recovery and Reoccupation Status

Summary of Structural Building Assessments Performed						
	Citywide	Staten Isl.	Queens	Brooklyn	Manhattan	Bronx
Rapid and Block Level Assessments	49,017	10,867	5,939	29,810	754	1,647
Windshield Assessments	33,022	7,853	12,319	5,023	994	6,833
Total Assessments	82,039	18,720	18,258	34,833	1,748	8,480

Building Assessment Results						
	Citywide	Staten Isl.	Queens	Brooklyn	Manhattan	Bronx
Yellow	7,808	5,955	1,039	440	319	55
Red	798	281	451	47	6	13
Total Assessments Needed	8,606	6,236	1,490	487	325	68

Detailed Inspections Performed						
	Citywide	Staten Isl.	Queens	Brooklyn	Manhattan	Bronx
Red	567	85	428	44	0	10
Yellow	183	5	69	79	29	1

Demolished by Storm – Confirmed	181	20	158	3	0	0
Re-Occupancy Self-Cert - Accepted	145	9	9	26	95	6

Total Remaining	7,530	6,117	826	335	201	51
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3. Community Outreach

- Staff members have been assigned to all NYC Recovery Centers and are providing building owners with information related to reoccupying and repairing buildings damaged from the storm.
- For red tagged buildings we are providing the following information:
 - 1) **Hire a New York State-licensed professional** (Registered Architect or Professional Engineer) to perform an assessment of your building and develop a remediation plan based on their findings. For a licensed professional referral please call:
 - American Institute of Architects (AIA) at 212-358-6113
 - Structural Engineers Association of New York (SEAO NY) at 646-736-0694
 - American Council of Engineering Companies (ACEC) at 212-682-6336

- 2) **Hire a contractor** to make the necessary repairs. Your contractor may begin work before filing an application with and obtain permits from the Department.
- 3) **File an application with and obtain permits** from the Department within 2 days after commencing emergency work.

OR

Submit a self-certification report from your licensed professional to the Department stating all repairs have been made and the building is safe for re-occupancy. Reports should be submitted to reoccupyzonea@buildings.nyc.gov.

4. Personnel in the Field

- Teams continue to be deployed throughout the city in the aftermath of Hurricane Sandy. The department's staffing for the last week can be seen below:

Summary of Personnel in the Field						
	DOB Total	Inspectors	Professionals	External Total	Consultants	Other
11/11/12	45	38	7	28	17	11
11/12/12	64	59	5	55	50	5
11/13/12	67	60	7	60	55	5
11/14/12	63	59	4	81	76	5
11/15/12	54	48	6	82	77	5
11/16/12	63	57	6	73	68	5
11/17/12	57	49	8	42	37	5

5. Re-Occupancy Self-Certification Submissions

- The Department has provided an opportunity for owners to hire a professional engineer or licensed architect who can self-certify corrective action to allow for re-occupancy of storm damaged buildings. Today, 3 certifications were submitted bringing the total received to 162.

6. New Filing Activity (for initially assessed Yellows and Reds)

- 245 Electrical Applications
 - 197 in Staten Island
- 5 Alteration Type 2's
 - 4 contained Plumbing
 - 2 contained Mechanical
- 0 Demolitions
- 0 New Buildings

Appendix F: Sample NYC Rapid Repairs Reports

RAPID REPAIRS APPLICANT INFORMATION

	01/07/2013		01/06/2013		01/05/2013	
APPLICANT DATA	Daily Count	Cumulative	Daily Count	Cumulative	Daily Count	Cumulative
Total Applicants	0	15,373	0	15,373	-4	15,373
Applicants Available *	37	12,151	-21	12,114	-29	12,135
Work Order Sign Off	229	8,156	125	7,927	365	7,802
New Starts	199		88		423	
Repairs Underway	2,145		2,102		2,148	
Repairs Complete	156	3,640	134	3,484	155	3,350
Residential Units	438	6,320	241	5,882	248	5,641

CONTRACTOR PRODUCTIVITY

Contractor	Completed Today	Cum. Repairs Complete	Cum. Residential Units Complete	Current Repairs Underway	Craft Labor
Conti	23	520	605	399	318
Gilbane	35	580	1,536	296	450
Judlau	-11	256	407	37	0
Navillus	25	489	508	451	249
Rockaway Beach	1	4	6	13	23
Skanska	22	617	1,042	540	252
Sullivan	25	242	330	114	126
Sweet	0	0	0	8	30
Tutor-Perini	36	932	1,886	287	608
Total	156	3,640	6,320	2,145	2,056

RAPID REPAIR PROGRAM BUILDING STATUS

	>= 6 Stories	>= 3 Units < 6 Stories
Enrolled	68	1,000
No Work Required (Buildings)	52	224
Work Order Signoff	0	129
New Starts	0	19
Working in Building(s)	2	183
Building Repairs Complete	14	208
Building Units Complete	754	839

Percent of Available Applicants Completed or In Progress **48%**
Number of Available Applicants Not Started **6,366**
Percent of Available Applicants Not Started **52%**

NOTE:

* Applicants available is total applicants minus opt out, cancelled, and inaccessible.

RAPID REPAIRS APPLICANT INFORMATION

	01/31/2013		01/30/2013		01/29/2013	
APPLICANT DATA	Daily Count	Cumulative	Daily Count	Cumulative	Daily Count	Cumulative
Total Applicants	0	16,518	27	16,518	0	16,491
Applicants Available *	-26	11,634	25	11,660	-33	11,635
Work Order Sign Off	60	11,042	107	10,982	87	10,875
New Starts	101		132		216	
Repairs Underway	1,438		1,564		1,679	
Repairs Complete	227	9,148	247	8,921	253	8,674
Residential Units	272	15,084	369	14,812	363	14,443

CONTRACTOR PRODUCTIVITY

Contractor	Completed Today	Cum. Repairs Complete	Cum. Residential Units Complete	Current Repairs Underway	Craft Labor
Conti	13	1,015	1,195	353	257
DSW	18	144	280	36	124
Gilbane	14	1,303	2,896	141	290
Judlau	0	145	174	0	0
Navillus	20	1,477	1,508	61	199
Rockaway Beach	19	317	827	42	74
Skanska	46	1,467	2,488	259	254
Sullivan	53	1,097	1,531	189	157
Sweet	11	285	420	40	105
Tutor-Perini	33	1,898	3,765	317	302
Total	227	9,148	15,084	1,438	1,762

RAPID REPAIR PROGRAM BUILDING STATUS

	>= 6 Stories	>= 3 Units < 6 Stories
Enrolled	64	1,204
No Work Required (Buildings)	50	312
Work Order Signoff	2	122
New Starts	0	2
Working in Building(s)	1	152
Building Repairs Complete	11	618
Building Units Complete	822	2,451

Percent of Available Applicants Completed or In Progress **91%**

Number of Available Applicants Not Started **1,048**

Percent of Available Applicants Not Started **9%**
NOTE:

* Applicants available is total applicants minus opt out, cancelled, and inaccessible.

RAPID REPAIRS APPLICANT INFORMATION

	02/28/2013		02/27/2013		02/26/2013	
APPLICANT DATA	Daily Count	Cumulative	Daily Count	Cumulative	Daily Count	Cumulative
Total Applicants	0	17,029	8	17,029	0	17,021
Applicants Available *	0	11,798	23	11,798	21	11,775
Work Order Sign Off	26	11,735	27	11,709	27	11,682
New Starts	36		25		23	
Repairs Underway	106		114		126	
Repairs Complete	44	11,575	37	11,531	51	11,494
Residential Units	73	19,710	250	19,637	159	19,387

CONTRACTOR PRODUCTIVITY

Contractor	Completed Today	Cum. Repairs Complete	Cum. Residential Units Complete	Current Repairs Underway	Craft Labor
Conti	0	1,299	1,528	0	46
DSW	11	428	827	10	17
Gilbane	3	1,519	3,274	22	58
Judlau	0	128	153	0	0
Navillus	1	1,554	1,586	3	30
Rockaway Beach	11	545	1,676	7	36
Skanska	-1	1,692	2,963	7	57
Sullivan	14	1,678	2,343	39	55
Sweet	5	508	807	16	45
Tutor-Perini	0	2,224	4,553	2	24
Total	44	11,575	19,710	106	368

RAPID REPAIR PROGRAM BUILDING STATUS

	>= 6 Stories	>= 3 Units < 6 Stories
Enrolled	62	1,262
No Work Required (Buildings)	49	338
Work Order Signoff	0	18
New Starts	0	7
Working in Building(s)	2	21
Building Repairs Complete	11	885
Building Units Complete	822	4,432

Percent of Available Applicants Completed or In Progress **99%**

Number of Available Applicants Not Started **117**

Percent of Available Applicants Not Started **1%**
NOTE:

* Applicants available is total applicants minus opt out, cancelled, and inaccessible.

NYC